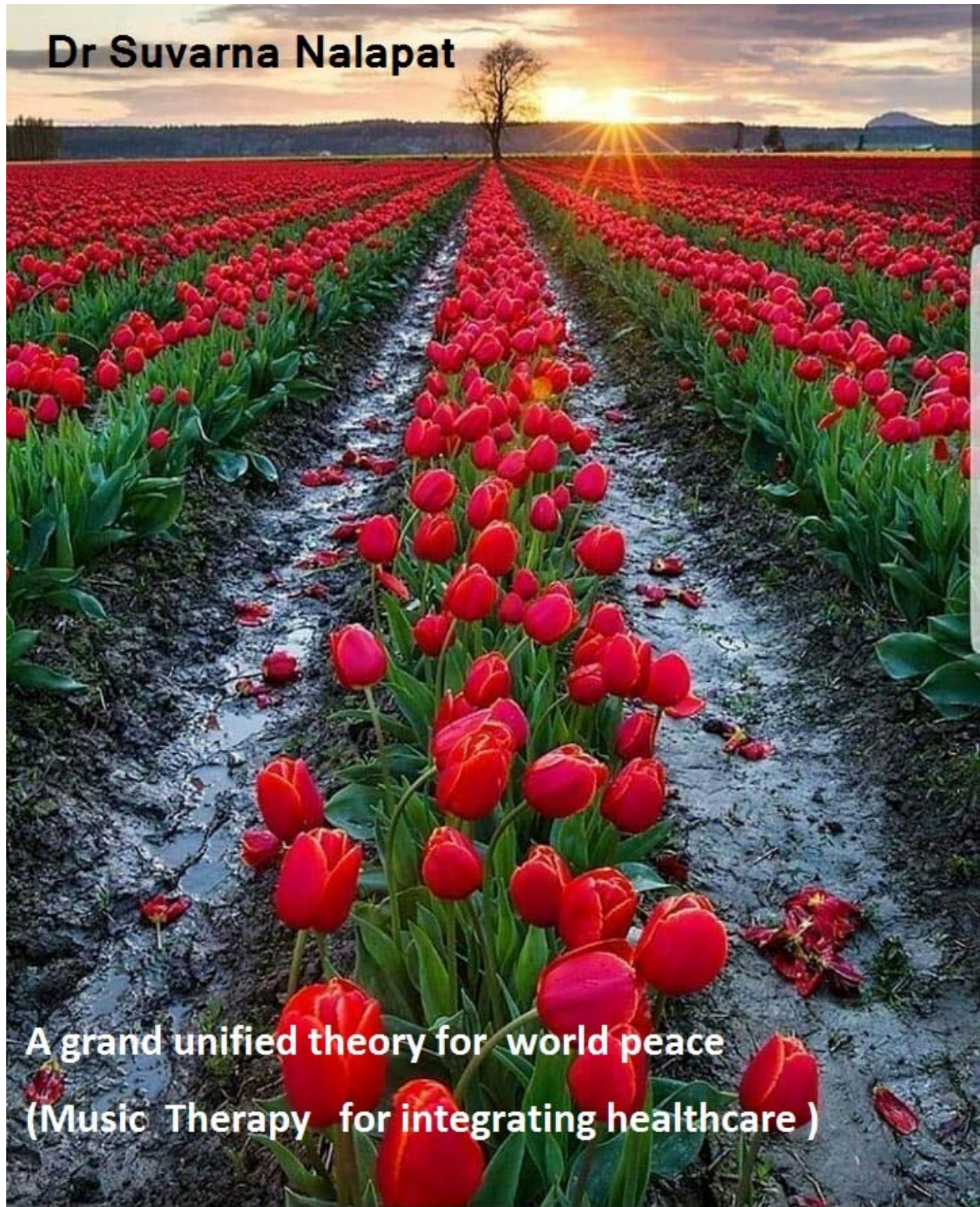


**Dr Suvarna Nalapat**



**A grand unified theory for world peace  
(Music Therapy for integrating healthcare )**

**A grand unified theory for world peace**

# (Music Therapy for integrating healthcare )

*Novalis : All illnesses are musical.*

*Auden : All healing is musical.*

*Suvarna Nalapat : All illnesses of the world can be prevented, cured or healed musically.*

Contents

Preface : Music and medicine

Ch 1 Integration of healthcare through music Therapy

- 2 Listening skills
- 3 Cancer –Arbudha / Karkkaroga
- 4 Behavioural Neuroscience and Music Therapy
- 5 Raagachikitsa as Narrative and personalized Therapy
- 6 Social Psychology in music therapy
- 7 Research methods for Music Therapy
- 8 skills,abilities and attitudes and qualities to be developed by Faculty .
- 9 Putting theory into practice
- 10 Stress tests
- 11 Amnesia or loss of memory
- 12 Evidence-based guidelines for CSHCN
- 13 Two questionnaires
- 14 Living in a world of sounds and lights
- 15 Measurements in Psychological field and mindspace
- 16 On dreams and human perceptions
- 17 Psychoacoustics
- 18 Solving challenges for healthy survival-Music Therapy
- 19 Teaching to selfheal

- 20 Two vital questions
- 21 Yesudas effect
- 22 Acoustics of Music and making dreams into music
- 23 Complementary and alternative medicine- Discovering India's past
- 24 Music and ritual
- 25 Principle of sound in music
- 26 The cassette culture and Yesudas music
- 27 The saaman chants
- 28 A grand unified theory for world peace by integration through music

## **PREFACE**

- MUSIC AND MEDICINE

“Medicine and art have a common goal ; to reach the ideal. To heal creation. This is done by paying attention. The physician attends the patient ; the artist attends nature...If we are attentive in looking , in listening and in waiting , then sooner or later something in the depths of ourselves will respond. Art , like medicine is not an arrival , but is a search.This is why , perhaps ,we call medicine itself an art”  
(M.Therese Southgate: Journal of the American medical association .Q Introduction: The healing arts An Oxford illustrated Anthology Ed R.S Downie OUP)

Music is the highest form of art and culture that epitomize the values and tastes of people. It reflects the “here and now”and is also a recaller of memories and shapes our future . I have already penned four books on music therapy and its research and this is the fifth of that series. In my earlier works , I spoke of the theoretical and practical aspects of my research and its use for humanity .The appreciation of music is beyond the texts, the artists, the audience , genre and personal pleasures . The musical tastes withstand the tests of time in people , especially in those who follow it with great involvement .The interaction of life and music is the same as that of life and literature, arts and culture . There are hidden meanings in the interaction of music and life which keeps us healthy throughout life, not only mentally and physically but intellectually and spiritually .

My research explored the merits of perspectives that relate music consciousness of music producer/singer , music practices/methods that produce a marked effect on society/on group audience and on individual listeners and how it could produce therapeutic/healing effects in them. Therefore , the research is aligned to an ethnographic study in media studies of the audience and touches realm of *ethnomusicology* , but it does not stop there. The research had focused on the tastes, on narratives , on performances and how all these affected the everyday life and health of people . Narratives on music tastes and at different timespans , and on performances of a single individual –with substantiated embedded narratives –in family contexts , domestic and professional music experiences , the facilitation of such experiences on a musician’s performance etc are very rare in literature . The narratives are radically contextualised in peer group contexts , in relation to the tastes and whims of the musical repertoires , and never attempts an audience research . But mine included such audience research and client research too .

I had started to write poems and create my own lullabies at age 8 , and I loved music even before that . According to Aries .P (1962:Centuries of childhood:A social history of Family life .London :Cape) a child’s independence and independent creativity starts at the age of 7. I have been analyzing (first unconsciously , and then consciously ) my musicality all through these years (Now I am 65) so that the sojourn is a prolonged one , almost as long as my chronological life cycle.

The research was structured to

- 1 Analyse music culture and subcultures from an interactive and methodological view of a single prototype performer and his numerous fans .
- 2.To apply sociological cultural theories to everyday life of young and old alike , in a musical environment
- 3.Historical context of exploring data of mass musical activity among Indian youth from 1946/47 to 2011 (post-independent years)
- 4.To contextualize a local site (Kerala) as a prototype of musical history and select a singer from there who has stood the test of time for over 50 years (from 1961-2012) and how the musical culture of the area was influenced by this one singer and continues to influence it
- 5.The model of the singer for indicating the relation between the private and public consciousness as well as a local and global production practice of commercial music.
- 6.This book, the 5<sup>th</sup> in the series is also designed as an integrative tool for arts and sciences and for use as a handbook of guidance for faculty training in music therapy

In cultural practice, especially in music , there is a concept of propriety to be judged by society. That means every singer is aware of

- 1.What to say and do
- 2.How to say and do
- 3.Engaging in teleoaffective selections such as emotions, tastes, moods during saying or doing .

For a singer saying and doing is mainly related to music performances ( singing and performing ). The defence of the practice depends on how the consumer (audience/music lovers ) and the producer (performer/singer) and their practices affect changes in each other for the betterment of the discipline of music and for betterment of society ( here , Music as a therapeutic tool).

How is the music in its initial phases of commodification influence and is influenced by the audience ?  
Dan Laughey (Music and youth culture 2006 :Edinburgh Uty press pp 92)) gives 5 stages

- 1.Imagination: The anticipation of pleasure derived from music , attaching pleasurable meanings to music (and sometimes to its source, the musician) and purchasing music as a commodity (records, cassettes, CDs etc ) for obtaining that blissful /pleasureable experience.

This for some people is a compensation for the disappointments /identity crisis/sorrows in life. For others it is a celebration of life , and fulfillment of one's life's goal .It depends on individuals and their tastes , qualities and is multifactorial.

- 2.Appropriation: Transformation of meaning into a personal and private life ..Appropriation of music is different from appropriation of the artist/musician .
- 3.Objectification: Embodiment of new meanings into everyday life –identification with music and self-representation
- 4.Incorporation : As a trusted companion that floats freely away , from ebbs and flows of mundane everyday life , to an ethereal, spiritual world .When radio was first invented , the power of music for this was recognized all over the world .Before that, in India , this power was known and experimented for several millennia in temples and in work spaces and theories formulated , and final proof for those came with popularization of music as a mass phenomenon .
- 5.The conversion of personal and domestic meanings and pleasure-seeking goals, find meanings outside the home and person, for a public context and for public benefit .(Music in temples , in office, cafes, in fields where people toil, in schools, educational institutions , royal administrative centers to relieve stress and strain and finally in hospitals )

Here the activity takes a *sociopolitical reformative goal* , locally, nationally and globally for better life, peace and learning and healthy thoughts and healthy life.The stimulus for individual consumption, feelings and emotions, has now taken a different form .The consumption has turned a full spiral circle of creation of music for society and the world. A person who has reached this final stage is not collecting music for own pleasure alone, but for pleasure and health of entire world and is researching to find out what and which type of music is the best theoretically as well as practically for individual clients and groups of clients as a regional/global group and why is it so .

*Ethnographic research to music consumption* is sparse in literature . Music is the most dynamic diffused consumer media and yet it is untouched by the most important ethnographic research .This is a surprising fact .Music is ubiquitously listened both in public and private spaces and yet not explored fully for use of society except as an entertainment. My research tries to fill this gap and to lead a path for research in the field of Medicine.

Sara Cohen (1993:Ethnographic and popular music studies ;Popular music 12(2)pp123-128) says the important role of music in everyday life must be glanced from a focus upon people and musical practices and processes rather than upon the musical structure , texts or procedures. This approach as well as a structuralist/poststructuralist theoretical framework were adapted and created by my research . It is a diffused audience model from the audience (consumer/listener) ranging from 1946 -2012 that I have drawn my examples and data and it is not a mere theoretical approach , but I do not ignore the essential structures and medical and other reasons for the utility of the musical repertoire as the best therapeutic tool from the point of view of a researcher/scientist/doctor/musician . The research had been an action research .

Far from the orthodox view of performance as context solely of production, the diffused music audience (consumer) influence the performer's tastes and performance practices and identities through everyday procedures and practices and interactions.

Taste is very important for discussion of an identity . Our past biographies construct our present tastes and our present identity . Articulation of the self to others is through narratives, fundamental to understanding of diffused complex music performances that can be generated only through shortterm and long-established audience (consumer) involvement and practices. Performative identity can be assessed by looking at two localities, two scenes , where the singer perform and by attending as many of these concerts as possible and observing performer behavior, musical repertoire changes in different places and also crowd/audience behavior changes in these places. I had taken a prospective study of this type on a single prototype singer for completing my project musically and ethnomusically . Urban and rural, Malayali and Tamil , sabha and temple and other situations (including concerts in schools , in domestic situations etc) have been closely attended for this purpose.. The metropolitan and rural aesthetic behavior of both the crowd and the singer is a study material worth experiencing . In some places a carnivalesque market place situation and in other places a sacred and nonconsumerist situation is evident in audience and organizational behavior . A sociological enquiry of individuals and of group performances is worthwhile.

- The Performer:

Appearance, dress code, musical selections and performance status, impression management of crowd, the way the raga are rendered, the stage and off-stage behavior makes an image of the performer for the audience . It is these variations and images which pose problems for a methodical research-oriented person who do research on performance . Locality has an important resonance for performative identity and for ethnographic research methods. Each locality has its own contrasting world of music , of



transmissions, compositions, learning and performance status and audience expectation. The trained musician, in each of the stage and each locality stick to the conventional notation and orthodox performance pattern and principles so that the audience respect him. The nuances that the team of musicians play and enjoy by a group experimentation and thereby self-learning and self-improvement is the original experience that a seasoned listener gets from each live performance of the singer with his accompanying artists and nothing can replace that novel original experience. The recorded music do not give that originality. The improvisations the trained musical team makes and enjoy themselves and makes us enjoy, is called the *Manodharma* music and here the orthodox trained musician has the liberty of a local orchestra singer which he uses perfectly well to the bliss of all alike.

Music is a collaborative network of art both by performer and the audience. It has a collective, not individual authorship, in this sense. Audience is a live part of entire performance and are participants as well as one with it. From such a participatory audience and their midst is a spectacular subcultural performer *Avathar* role is created. It accounts for emergence and maintenance of a musical tradition- whether local, classical or popular folk. Local musical cultures possess unique historic traditions of ritualistic enactment and performance untouched by global consumption patterns and mass media power. A romantic place of sacred refuge as well as a highly concentrated music industry dominated by International entertainment media conglomerates in the present day musical phenomena. And each has its place in ethnomusicology and musical traditions of the present world. The romantic sacred refuge is what we find among the audience who come for a live classical concert.

Lifestyle choice is important in constitution of self identity and daily activity of the performer as well as the listener/audience. (pp 104 Dan Laughey). These self identities simultaneously constituted and prepared through sociocultural practices that can reflexively change or reconvert identities of individuals within groups, and therefore the identity of a group themselves.

- Music Lovers :

There are different styles of music lovers which are compared to the modern habits of people. Five of them are

- 1. The pilgrim : Singleminded devotion to music and an unwavering sense of direction or the goal
- 2. Stroller: Stroll by zapping remote controls and shopping malls and city streets in search of pleasures of music
- 3. Vagabonds: The stranger. No settled place. No local identity. An ever mobile lifestyle and career and musical preferences like a Gypsy.
- 4. Tourists: Seeking novelty of experiences. It is an escape from the day to day boring routine of professional life they go as tourists of music
- 5. The player. Embrace the rules and regulations and outcomes of a series of self-games and chances. Is always in search of or in pursuit of a professional promotion and success.

It is the pilgrim and the player who makes an identity for the music that they create and enjoy together , and gives an aura and sacred image to the culture.They make the sacred pair . The others are just onlookers, and beneficiaries .

The self presentation of several performers may be actually different from their self identity . Performers make/try to make an impression on others/audience. In that they are guided by expressions and habits of the fans and hence they are presenting an image according to what their audience want them to be and this is for professional success .Therefore ,the identity or the image of the singer/performer is due to expectation of the crowds and what the performer emulate is the wishes of the crowd and it may or may not be their real self identity . An ever moving continuum through single audience interaction leads to the self presentation . It is a process of disclusive communication between the performer and the listeners . In many of the carnivalesque(market place) and promenade performances (clubs/rock concerts etc) we find a communication between crowd and performer and that is what is seen in many reality shows on the TV too. But that type of communication is not what we get in a live classical concert . There is a more subtle and more indepth communication of the soul of listener and performer which both enjoy and benefit from .

Therefore , though in music therapy we start from using the loved popular numbers of individual listeners , the final aim is not just that but leading the individual through successive steps to a more rich and healing experience from the best music .

When we take a survey of musical media use , we get a result that listening to music less than one hour a week is less , compared to listening to music more than 9 hours a week . And in gender ratio males are more in the group who listen to less than an hour and females in more than 9 hours a week .This shows that women are more interested in hearing music .When we look at the involvement continuum of musical media use intensive use is more among males and casual consumption among females.Intensive use means a development of taste group exclusions, alternative tastes (specifications of tastes) specific relationships as well as a publicized realm of that preference. The Casual consumption of females have more of a populist taste, broad relationships, and no specific taste developments and it remains in the privatized realms never coming to the publicized (open) realms. This is especially so in Kerala. But in Tamil Nad (Chennai) both male and female audience have equal involvement patterns in music. Everyday life narratives of several people endorse a methodological spirit and capture of music for personal enjoyment . The progressive processes by which past experiences of music influence the present ones and can be utilized for future guidance is important for any music therapist . Influences like personal preferences from childhood improved over the years, peer or Guru influences and influences from an elder family member is often narrated by majority of people in development of their musical tastes .

A public music practice is marked by a person who leads (performs) and several people who follow (listeners) and sometimes it is difficult to say who leads whom . The listeners lead the performer to perform in a certain way . The performer performs better with feedback from an ardent listener /music



lover . Not from the average listener , who just enjoys and becomes his/her fan. Practitioners of music who distinguished themselves as a more favourable one with the audience is called an “Exclusive performer”. A listener who distinguishes himself/herself as a favourable and perfect listener is an “exclusive listener.”An exclusive performer and an exclusive listener creates history .

Inclusive is a term which does not find any difference between the listener and the singer. The sense of belonging is so intense that singer /listener merge as a single whole entity in a musical experience . Thus an exclusive singer and listener are inclusive identities. The neotribalism treats this phenomena of inclusiveness with Eclecticism . But eclecticism is a collective communal identity. And inclusiveness is not that . It is not a communal identity but a musical identity that is created and any individual belonging to any community or group can become inclusive in a musical identity . This is experienced in the classical concert of our prototype singer as I had already pointed out elsewhere. It gives an alternative musical experience . It provides an eclectic atmosphere which is romantic, sociocultural , philosophical and secular at once . This simultaneity is something that distinguish the classical concerts of an exclusive singer which makes him/her inclusive in the listener’s self identity .

In page 170 and 175 Dan Laughey gives how exclusiveness and inclusiveness are differing and how accountability and involvement in music by these two phenomena can be assessed .

Exclusiveness	Inclusiveness
1 Specific tastes	Broad tastes
2.Niche sensitivity	Mainstream sensibility
3.High cultural capital	Moderate
4.High financial capital	Moderate
5.group individuality	Individualistic
6 performing in public spheres	Listening in public contexts

My fieldwork and research had been *Associative research* from 1962 to 2010 (unconsciously done and retrospectively retrieved) and from 1972 onwards it became a conscious process and what I had gathered from such lifelong research , I tried in a hospital situation as a pilot project , and

semistructured and structured questionnaires and interviews done with different types of populations which include children from schools and colleges, adults from Religious institutions like Amrithanandamayi and Satyasai organizations, Vivekananda Vedic foundation and professionals from various institutions both private and public, from volunteers for music therapy pilot project, and from patients , and from regular music lovers of different types , from sabhas, concerts and also from the internet communities (from their natural disclosures –not with questionnaires). These population studies are mainly from Kerala (Malayali) but from Chennai , the same results are obtained from Tamil ,Telugu and Kannada speaking audience . Many of them come from nonresident Indian population .

The initial stages questions were mainly on what type of music the individual loved and listened to and how many hours a week ,which singer's voice they preferred and the reasons for such preferences,and whether the listening style was influenced by family/peer etc ,whether they go for live concerts or hear recorded music and what type of feelings/experiences they have with such music . And how they rate music as an influence in their life . Or rather what effects they felt in body and mind and intellect and spiritual life with their preferred music and how they value that experience .

From the second stage these basic questions were analysed and expanded so that more specific answers were obtained by tailored questions. For example instead of asking what type of music the person prefers ,the options of Classical south Indian,Hindustani,ghazal,film music,light music ,folk songs etc were incorporated in questionnaire .Similarly to know any change in taste of the music preference at a specific age was asked and reasons sought for such a change in preference .

In the third stage research it was a fully structured questionnaire and individual interviews combined so that more and more objectivity to the analysis was gained .

Love,birth,age and death are not pathological events or processes but they can be of professional interest to doctors , nurses and of personal interest for all human beings .Ailments of people are outcomes of strains and stresses of life and lifestyles,and many of the routine cases seen by a family physician can be professionally healed without “medicalizing”ordinary problems. Experiences of ordinary people and of medical professionals will be of use in celebrating ordinary human life and music therapy gives protection and enhancement of immunological strength and reduce stress and thereby prevent disease and reduce its complications.

- Power of Music in life

The humanity of music , value of musical expression , contemplation and thought and transcendence of idea as expressed through sound are concepts that regrettably continue to decline in modern world. Music has become isolated from other areas of life, and is no longer considered as a necessary aspect of intellectual development . Just as in Medicine, the music world has evolved into a society of specialists who know more and more of less and less. The musical education has become increasingly specialized and limited .This educative system produce competent instrumentalists and vocalists who possess little knowledge or fundamental ability to delve into, comprehend , and express essential substance of music. The student is advanced technically in executions essential for a professional musician just as a medical graduate . Nature of music is inexpressible except through sound. From this deep mystery of essential

truth, current practice is moving away , focusing more on the separation of physical dexterity to produce sound on an instrument/or vocalist and dissecting the music structurally and harmonically without concentrating on the active participation or experience of its power on living beings. This is because of overwhelming growth of music as a business in present times , and I equate this to Medical business. Both requires a new impetus to its goals and deep understanding and an integration of these two disciplines brings about precisely this .

Listening with open ears and mind/heart is the first prerequisite for experiencing the power of music. This in Yoga is called Sradha (dedicated concentration) . One can understand the depth of musical knowledge that allow oneself to enjoy it, (a thoughtful introspection called Manana) and also the intention and originality of the performer , his/her approach to music and audience and how it is manifested in oneself and on audience behavior as a group/community and how the effect is sustained by the sradha of the listener as well as the genuineness of the performer/listener interrelationships. This observance of a public performance, and the continued criticism of effect of it on audience and also an appreciation of its various aspects for social benefit constitute a music therapy programme . Thus it is practical as well as contemplative , insightful, and is not just a personal reaction to a sense object and its experience but an attempt to enter the heart of music through the performer and his/her motivations and the effects it produce on his/her listeners for improving physical, mental, intellectual and spiritual health .The obvious, the literal and readily understandable or graspable things are seen by all. But to have insight into the hidden meanings , the rare jewels of musical repertoire regarding musical experience is not in the realm of all. It needs to be addressed in communications (books/speeches/ media et) so that everyone can at least have a basic knowledge of the depth of music in everyday life and in health . There are no two aspects of being human that are not related to one another. Therefore music and its relation to every other science and art of the land and to human life and health is essential for this integrated approach . Logic is inseparable from intuition, rational thought is inseparable from emotion , because our brain is structured in that way . Music has both logic, science, and emotion . If we separate these elements in music ,what we are left with , is not music but just a collection of sounds . The music education for technical excellence is leading us to that realm in modern times. The principle of integration is there in acoustic balance to peace talks . When I was a 14 year old girl , I was interested in the Four-Power summit meet for global peace and my elders were surprised that I am so much involved in a global peace treaty at that age . (One of my aunt's letters –My aunt is the Padmabhooshan/ Saraswathy Sammaan author BalamaniAmmam- expresses that wonder). Probably when a seed germinates its inner qualities are expressed even in the sprout stage to show how it would develop into a tree . Intellectual and emotional balance is the homeostatic thermostatic balance we need as global citizens to enjoy a peaceful co-existence and music as Saamaveda , gives us this power . Music is a cultural field .The interest in music is a dynamic changing phenomenon from infancy to old age as a continuous spectrum of superimposed tastes that develop right from the cradle/or womb .It is our daily life .

Many performers and celebrities are having mood changes and eccentricities recorded by several critics. Glenn Gould's eccentricities and extraordinary performances are recorded by his fan and critic Edward Said . An intelligent audience cannot be satisfied by a loud and fast playing alone. There is a virtuosity of

style, where we feel intellect as well as taste allied with formidable technical command. Premodern music festivals were symbolic rituals connected with agriculture, religion, astronomical events and modern music festivals like Markazhi festival in Chennai is commemoration of such prehistoric, historic, premodern concepts of humanity. They have now become great commercial and tourist attractions too. Our dim anthropological past and the dazzling modern/postmodern existence are interwoven in such events. The tourists get a musical experience as well as a taste of our anthropological past and an enhanced enjoyment different from the routine life. The aesthetics of such music festivals is due to this integrated past and present in our memory and experience. Muthuswami Deekshithar and Tyagarajaswami and SwathiThirunal come alive on a 21<sup>st</sup> century artist's *manodharma* and take us to the ancient *bhakthi* states. Bits of original inspired and rare music making adds flavor to the experience for an intelligent and highly attentive listener. The festival music is for the multitudes, in a charming aesthetic locale with an extraordinary past, at a specific astronomical moment for harvest, agriculture and devotional thanksgiving and worship of the divine. At festivals music is a part of the occasion and a long series of performances at a festival is like many records we have in our library – available, accessible, ready for instant use. And it is very rare to find teaching and singing rare and new compositions in a festival season except by a few singers. Original performers have to include usual numbers for mass satisfaction and then, include a rare and lost Krithi /composition for protection of that composition/krithi and for satisfaction of the ardent listeners. Only then we can do justice to the discipline of music, apart from getting wide publicity as a performer.

New York has a Mozart festival. Guruvayur has a Chembai festival. Thiruvananthapuram has a Swathi festival. And Ohio and Thiruvavoor has Tyagaraja festivals and so on. The Markazhi festival is different because it is a festival in the name of Markazhi (an astronomical and seasonal event in the subcontinent) and not in the name of any individual singer. All singers are respected, celebrated alike in Markazhi festival as torch-bearers of the discipline of Music. It is music that is celebrated and not an individual singer alone. This makes Markazhi festival different. This is so in the case of Navarathri festivals also. Each singer, each piece of music is a homage or offering made by each singer at the feet of the divine Brahma and his consort/sakthi the Goddess of Vidya. There is a sort of Apourusheya vedic aspect in such a festival. In a festival in the name of a single singer this apourusheya vedic aspect is not there. But, the shishya and the followers of each living Guru starts such festivals in honour of their Guru so that the style of the Guruparampara is not lost to posterity. It is the smriti tradition.

The language of music is expressive but mysteriously elusive too. Musicological analysis can describe changes in life, in styles, features of form, tonal palette, logic and harmonic language of the work as well as the effects it produced for a better life and health. The connections in a meaningful way of the singers and listener's lives and musical enjoyments and its sustained relationship only can explain the effect of music on a listener. It is a synthesis of all these.

We all know that Mozart's six children survived infancy and that Mozart was always in precarious health and died in 36<sup>th</sup> year, in December 1791, an exhausted, pathetic man of acute rheumatic fever. Wearing sumptuous and gaudy clothings, inventing Adam as one of his wedding-document names, and a marked antipathy to France and an irrational fear of trumpets till age nine, Mozart's life history is far from any therapeutic effect on himself or his family. His relation with son Leopold was of disquieting emotions,

rebellious and trying to conceal the wounds and powerless to change the course (pp193 Edward W.Said).

Recently I studied a case study on Beethoven by Dr John Dagga (1933), a musical genius but a man who suffered wide mood swings ranging to maniac-depressive and is said to be bad in everything except music. He was deaf (from 27<sup>th</sup> year), had continuous chronic intermittent fevers, recurrent musculoskeletal pains and in 1821 he had jaundice . In 1823 he had pain in eyes and photophobia, in 1825 haemoptysis and epistaxis and weight loss. He had severe inflammation of bowels , a gross abdominal swelling developed with jaundice, pleurisy and diarrhoea and a marked leg swelling . Four time his abdomen was tapped and 12 litres of fluids removed each time. The fluid leaked continuously after one such occasion and Beethoven remembered “Moses striking a rock with staff to bring forth water “. Coma supervened later and even in the last stages of his illness he continued to compose his 10<sup>th</sup> symphony and he had no tremor in writing out the composition (though the writing trailed off at the right of the page). That means he didn’t have hepatic neuroenkephalopathy .The deafness was due to otosclerosis. He had skin abnormalities of his face which was scarred and coloured and simulated leprosy and atrophic discrete and confluent scars and tissue thickenings around nose and lower face. Dr Johann Wagner and the famous Dr Rokitansky performed postmortem on Beethoven. Despite the paracentesis there was four quarts of turbid fluid remaining in abdomen. The gut was dilated and gas filled. Liver shrunken half its size and beset with nodules , the size of a bean. Spleen was double the normal size , gall bladder filled with gravelly sediments. Pancreas indurated . Macronodular cirrhosis, splenomegaly and portal hypertension, chronic pancreatitis and Gall stones will be the diagnosis in modern terminology .The guts were dilated due to ileus. Auditory nerves atrophied , shriveled . But when grave reopened in 1863 and 1888 and skull got in several pieces, the temporal bones were missing . Interpretations of chronic ulcerative colitis and chronic active hepatitis, sclerosing cholangitis, and an autoimmune multisystem disorder and an abuse of alcohol and Syphilis as cause of his multisystem involvement and autoimmune disease (as well as deafness) is evident and interpreted by experts .Mozart had a pauper’s funeral but Beethoven had a pompous showy one in Vienna . Beethoven died in his 56<sup>th</sup> year . In contrast to his genius creativity Beethoven was a physical and emotional wreck .He didn’t even had the good fortune to listen to his own beautiful music .Yet his Olympian musical energy , imagination and innovation triumphed over it all to enrich music and enjoyment of music lovers. In the life of ancient singers of India , this sort of dissociation of personal life from professional musical life is a rarity because for them music was a yogic sadhana , merged in their lifestyle , not just a hobby or a commercial passion alone ..

This case history I quote , just to show that being a musician alone does not keep us disease-free (just as being a doctor alone does not keep us disease-free). All the modern musicians and doctors have to think over this and learn to integrate the physical , mental, intellectual and spiritual health in their personality so that both music as a discipline and music therapy for themselves for a better individual life will be of some use . Music is an ocean. Medicine is another ocean .When we integrate these two oceans , a larger ocean and an ocean which is more than the sum of the two is born within us and I do hope the readers will be able to visualize that peaceful , waveless, timeless ocean of Vidya within .

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- **Chapter 1**

## **INTEGRATION OF HEALTHCARE THROUGH MUSIC THERAPY**

**Abstract :** Healthcare programmes should cater to enlightened citizenship, humanitarian values,compassion to all, increased positive self-esteem ,satisfaction and happiness to clients and caregivers. Satisfied life is the doorway for consistent health. It educates one to be useful to society,nation and world, facing life with courage and compassion, enjoying every moment . Every single person is a possible valuable contributor to the cause .Money alone is not contribution/donation , but ideas,thoughts,suggestions, service and commitment are valuable. Such an education is defined as a holistic dialogue , a service and character building for integrated personal and national development and

is the true learning for value based education model . Community health education through Music Therapy is all these and beyond . ***An Integrated Curriculum for cost-effective healthcare and Social-empowerment , human resource development through universal medium of music for peace envisages this.***

***Key words:-***

***Music Therapy; Integrated Curriculum ; cost-effective healthcare ; Social- empowerment ;worldpeace***

**Introduction:How and why this project originated :-**

Happiness is not just absence of pain ; health is not merely absence of disease. Lack of nutritious food , and diseases caused by chemicals makes us think of history and science of food production, agroecology and its status .Why is a fertile country like India , unable to meet food sufficiency and high nutritional status ? . Why with enough monsoon rains , a locality faces water scarcity ? How best waterborne diseases can be prevented with water conservation and judicious use of it ? How best the indigenous plants,herbs and foods can make the food sufficiency and nutritional and health requirements of a nation ? Health cannot be achieved merely by the curative aspect of costly hospital medicine and drug therapy with several known and unknown side effects..A holistic approach with indigenous practices and lifestyle is necessary for a nation to achieve what it desires in health, agroecology and protection of natural resources so that healthy resource management is possible..

Kothari commission( 1964-66) had introduced social dimension to objective of education. In 1986 National education policy envisaged education that promote national cohesion, scientific temper, independence of mind and spirit, goals of socialism, secularism and democracy –fundamental to allround development -material and spiritual. National self-reliance can only be attained by such growth. Such a revolutionary sociopolitical educative initiative needs a Personal Education plan (PEP) in relation to a

Practice development plan (PDP) for integrating healthcare.

PEP has 5 steps: Context,Experience,Reflection,Action,Evaluation.

Context is the life situation of the learner . Beyond the intellectual grasp ,education has ability of using imagination , feelings etc and that makes experience . Thoughtful reconsideration of subject matter , or



experience , idea, purpose of spontaneous reaction to grasp its significance fully is reflection. Memory, imagination, feelings, cognition are used in it. Action is that which makes the learner decide one's point of reference on which one acts. The interiorized choices become externally manifested in actions .

Evaluation of learning by effective feedback make us explore further , and find out alternative methods/solutions for the accepted /formal current ones . Every teacher/learner/educationist have experience of these steps in their process of education.

The evaluation and further growth , by reexamination of whatever had happened , and reflection on it leading to improved actions has an effective cyclical pattern . For high quality healthcare of a nation, and CPD (continuing professional development) of this type and clinical Governance agendas the mechanism of lifelong learning is needed. We learn by Reflective learning cycles in Clinical healthcare practice.

- What we need to know? learning objectives.
  - What did we notice? observational data .
  - What have we learned from them? Evaluation of data/experience.
  - How will we apply that to our practice? clinical relevance of application of experience.
- 
- What we need to do next ? Reflective educational audit.

This is essential for continuing science for benefit of society .Therefore a Personal Education plan (PEP) develops only in relation to a Practice development plan (PDP) and this is within the area of integration of any Healthcare development agenda. The need to know the use of other medical and healing practices prevalent in society , and demonstrable by self-assessment (Reflective learning cycles) and small group learning within practices is essential as a work based continuing Education.By such interdisciplinary learning we can assess our own professional limitations and our unlimited potentials by Reflective learning cycles.

Approaches to NHS provision of complementary Medicine (Zollmen ,Vickers 1999 BMJ 319:901-904) envisage a clientcentered approach.

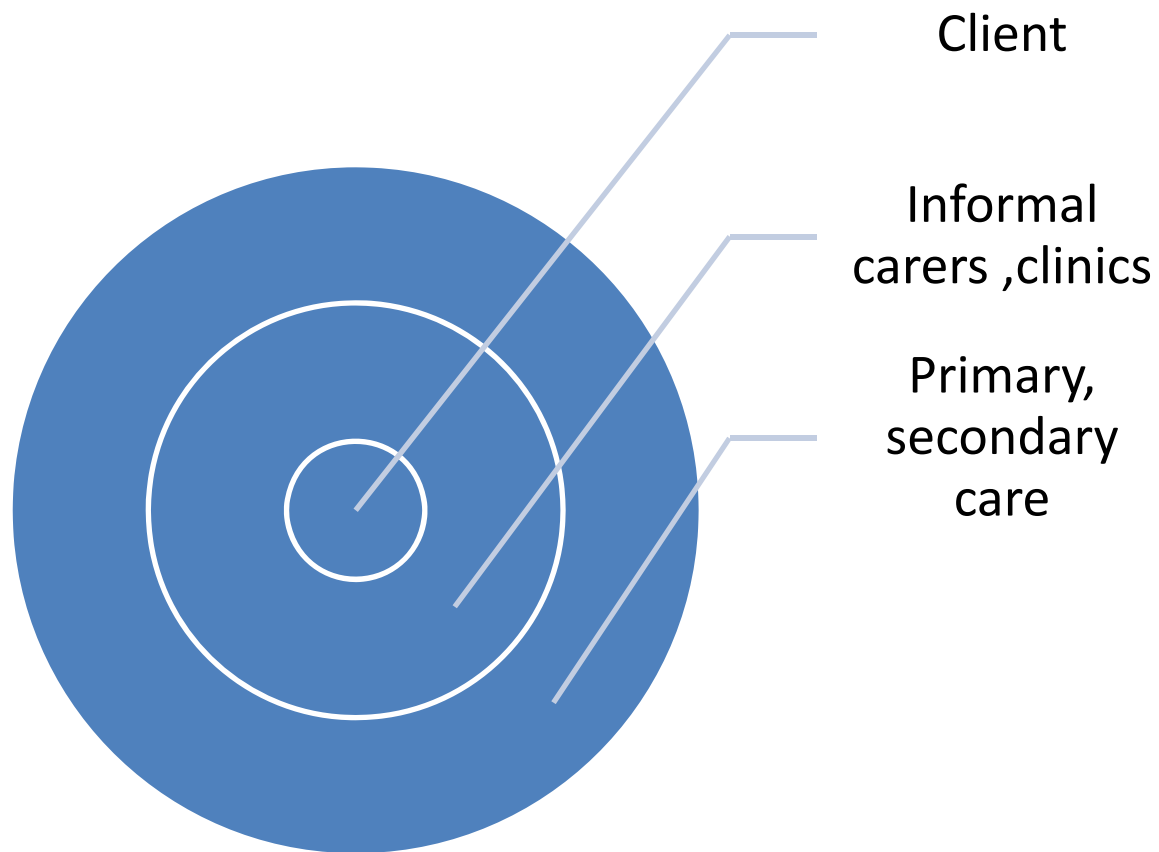


Fig 1.Diagrammatic representation of client-centered approach

“If intelligence is the capacity to adapt to challenging situations then the central nervous system and immune system has this ability beyond all others. If these supreme exemplars of rapid and subtle adaptation did not tap the other’s limitless potential for variation , healing would not take place and we would not survive as a race.” ( Norman Geschwind 2002 pp 26)

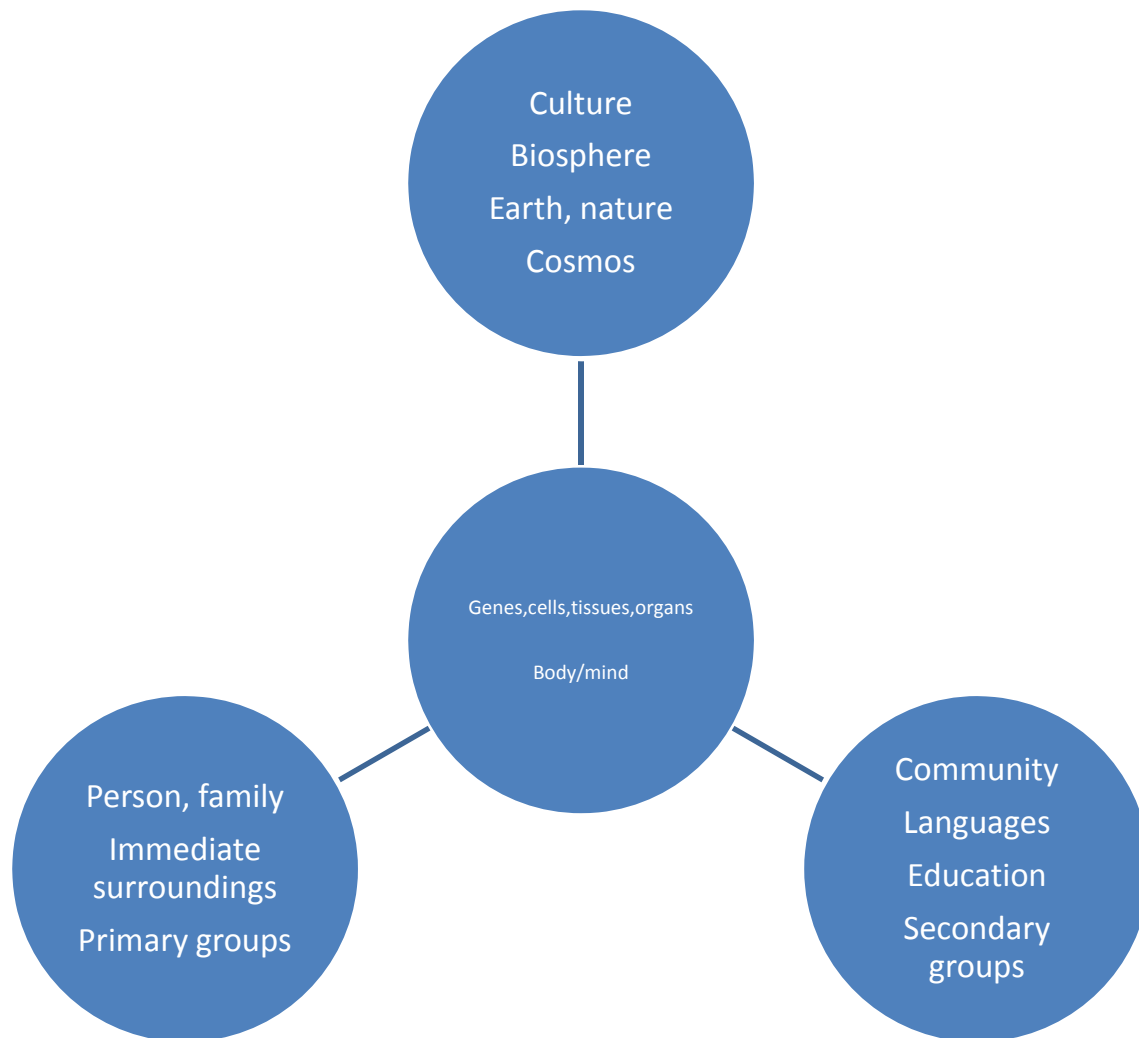


Fig.2 Gestalt model of biopsychological medicine

When environment is polluted, when food and clean water is not available, when wastes are not disposed of properly and when job and education is not provided the community become unhealthy. Nature and human existence is intertwined and disturbance of one disturbs the other. Mere expenditure on drugs and grand multispeciality hospitals alone will not be enough to ensure nation's health and progress. This is the modern understanding of health and value of integrating healthcare with indigenous methods suitable for each geographical situation is essential.

Research to know Indian situation:-

To learn Indian situation, on basis of preferences and attitudes of people in Kerala ,and to formulate an integrative approach with Modifications according to India's needs, research was undertaken (Nalapat 2008 a,b,c) . The popularity of complementary therapy is a code message for demand for more acceptable and effective healthcare both abroad and in India .This understanding is essential for all healthcare professionals.

### ***1.Why Integration ? Why through Music Therapy?***

**Why should we Integrate ?** ( Vincent C and Furnham A 1997; Furnham and Bhagrath 1993;Kelner and Wellman 1997;Furnham and Beard 1995;Astin 1998;Anna van Wersch,Mark Forshaw and Tina Cartwright .2009 ;Edmund T.Rolls 2007)

Important trends :

- .International peer-reviewed specialist journals and studies on non-conventional medical practice have already appeared in established conventional publications.
- Report of British Medical Association Board of science is in its favor
- Universities have degree programmes in Complementary therapies. Majority of medical schools have begun to include material dealing with approaches in undergraduate curriculum
- Foundation of Integrated Medicine (FIM) established in UK .
- National center for complementary and Alternative medicine is established in USA (NCCAM) for research and evidence collected as data .
- Effectiveness of non-conventional therapies have been proved .

#### **1.1 Reasons for popularity of CAM :**

(The Welcome trust .2000):

- Pressure on health system
- Lack of time spent by doctors
- Where the conventional Medicine fails , the success of CAM is noticed
- Public concern about reductionist approach to illness
- Incidence of side effects of conventional drugs

The questions of Evidence-based and client-centered Medicine is thus being answered .Healthcare professionals of any nation has a responsibility to meet the patient's needs as well as a social responsibility to manage limited resources. The popularity of complementary therapy has to be seen as a code message of demand for more acceptable and effective healthcare. Vincent and Furnham(1996);Bishop et al (2007);Conrad (1985);Donovan and Blake (1992);Horne et al (1997);Carwright and Torr (2005)Wilson and Andrews (2004);Kelner and William (1997);Noble (1998);Org et al(2002);Luff and Thomas( 2000) ;Sharma (2001);Scott et al (2003);Bakx (1991); and Coward (1989) have described the reasons for popularity of the complementary practices over conventional western medicine .Multiple means for improving healing relations is the focus of a good National policy (R.M.Epstein et al 2010)

### **1.2.Key issues to be addressed**

- What needs might doctors have for wishing to introduce Integrated medicine in practice? Will that fulfill the perceived unmet needs of the community?
- What are the concerns the doctors have about its introduction ? Are unreasonable assumptions made about its effectiveness?
- To get evidence for effectiveness , one has to do it first and get data oneself. And without doing that there is no reason for saying that something is effective or not effective.
- Is the new system effective as well as safe and without side effects?
- What are the clinical Governance issues , regulations, training and quality assurance.
- Can it be used cost-effectively in mainstream healthcare?
- Governance , regulation and quality assurance

### **1.3.Training :-**

Common standards , accredited training involving extensive field and hospital based projects and teamworks,courses at University level are needed . Whether the institutions and organizations select appropriate personnel for training as Faculty members is to be controlled by the University as well as the Hospital/Institution under which the Programme starts. Selection of a bad team is detrimental to entire edifice of Integration. Most of the programmes face a natural death because Governmental selection is based on seniority and on hierarchical preferences and not based on the aptitude and willingness of the person concerned , totally overlooking the HRD part of it .

#### 1.4. Regulation:-

The Medical Councils have some self-regulations which have become outmoded in present situation. Guidelines given by the FIM (<http://www.FIM>) may be taken as baseline and modified according to needs of each Nation. The different organizations practicing different modalities of healing has to come under a common body of Integrated Medical practices in which all gets equal share of representation .

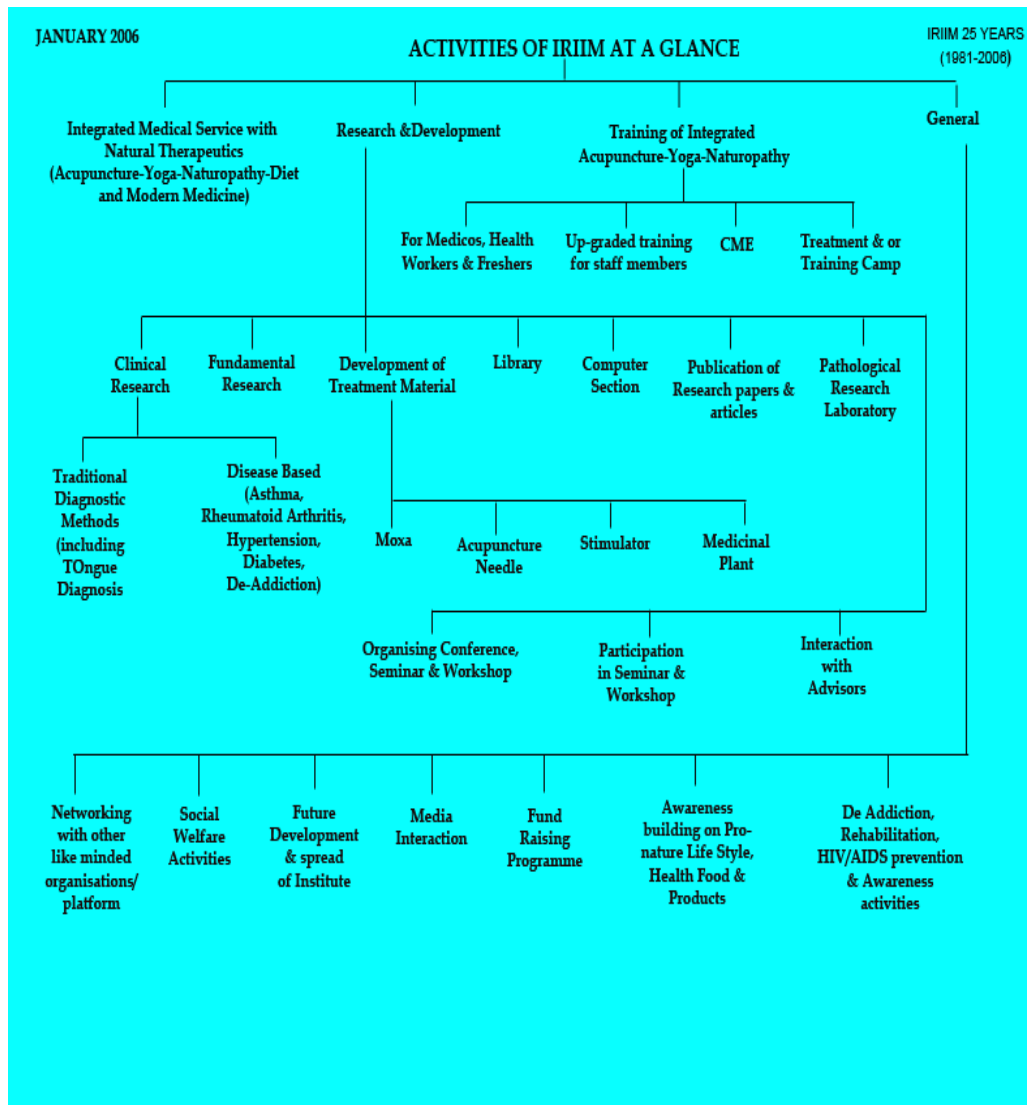


Fig 3:-Activities

of IRIIM for 25 years (adapted from IRIIM Jan 2006)

Integration of practices is already on its way .But ,no one seems to have thought of using Music as a Golden thread ( *Soothre maniganaa iva: Bhagavad Gita* ) to make the integrated garland of all healing methods, arts and sciences , bringing east and west for world peace and a meaningful existence of

tolerance on earth . That message of *Advaita* given by *Samaveda* and music is taken up to solve existing controversies.

## 2.Why Through Music therapy ?

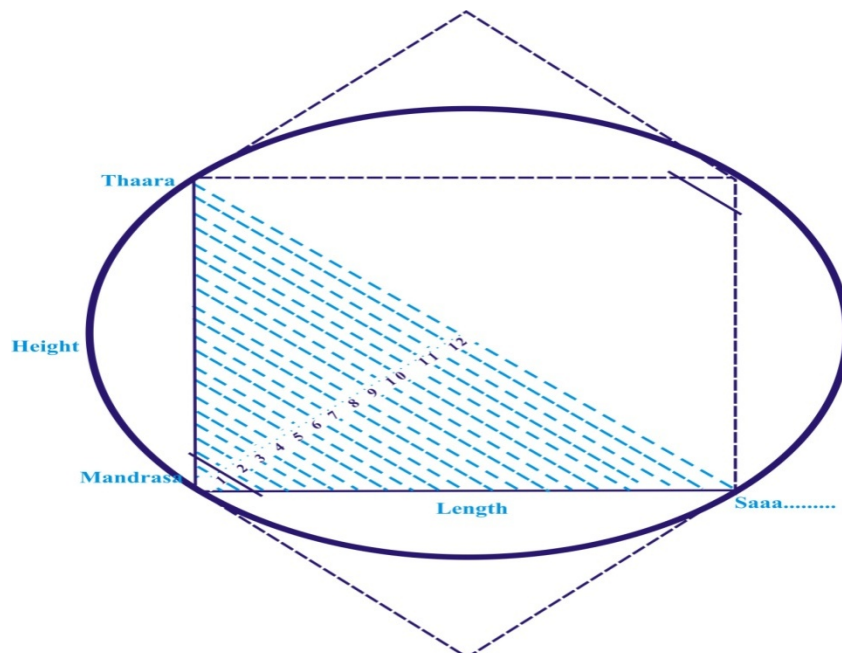
### 2.1.Definition

Indian Music therapy is a system in which physical,mental,intellectual and spiritual wellbeing of all is considered. It incorporates Vedic traditions with other traditions of the land.( Nalapat 2008 a)Hence integrating any indigenous medical practice with research protocols of Modern Medicine is easy and with sound theoretical and practical basis.

Indian music has its base in *thridosha sidhantha* , and in *sabdasasthra* which is essential for all Indian systems of philosophies and sciences. It is based on *Naadalayayoga* or *Naadaanusandhaanayoga* of *Pranava* and is used by *samaveda,sidha,yoga,Ayurveda*.. Use of Indian music by medical practitioners is popular among all Indian doctors. What one has to do is use this integrating golden link for uniting the indigenous and western medicine. All the differences of opinions existing in the theoretical and practical integration of healthcare can be removed by the use of music as therapy and in therapy .

### 2.2 How music works :

Music Therapists use *Swara* and *Raaga* as both *dravya* and *adravya* (matter and energy) for healing and therefore both biomedical as well as astrophysical (energy) levels of healing are employed and this is the crux of its universal use as a integrating medium .





*Swara* as *dravya* is measured by its length and height and volume as well as the time , still is invisible to eye .*Sabda* is quality of *Aakaasa* (one of 5 elements, the spacetime continuum ) and is *Ekaguna* and that is why *Aakasa* and sound (OM symbol) is considered as symbol of God . God, sound and *akaasa* are experienced but cannot be perceived by gross senses .Hence both *dravya* and *adravya* simultaneously.Indian

Fig 5.Samayachakra (North India)

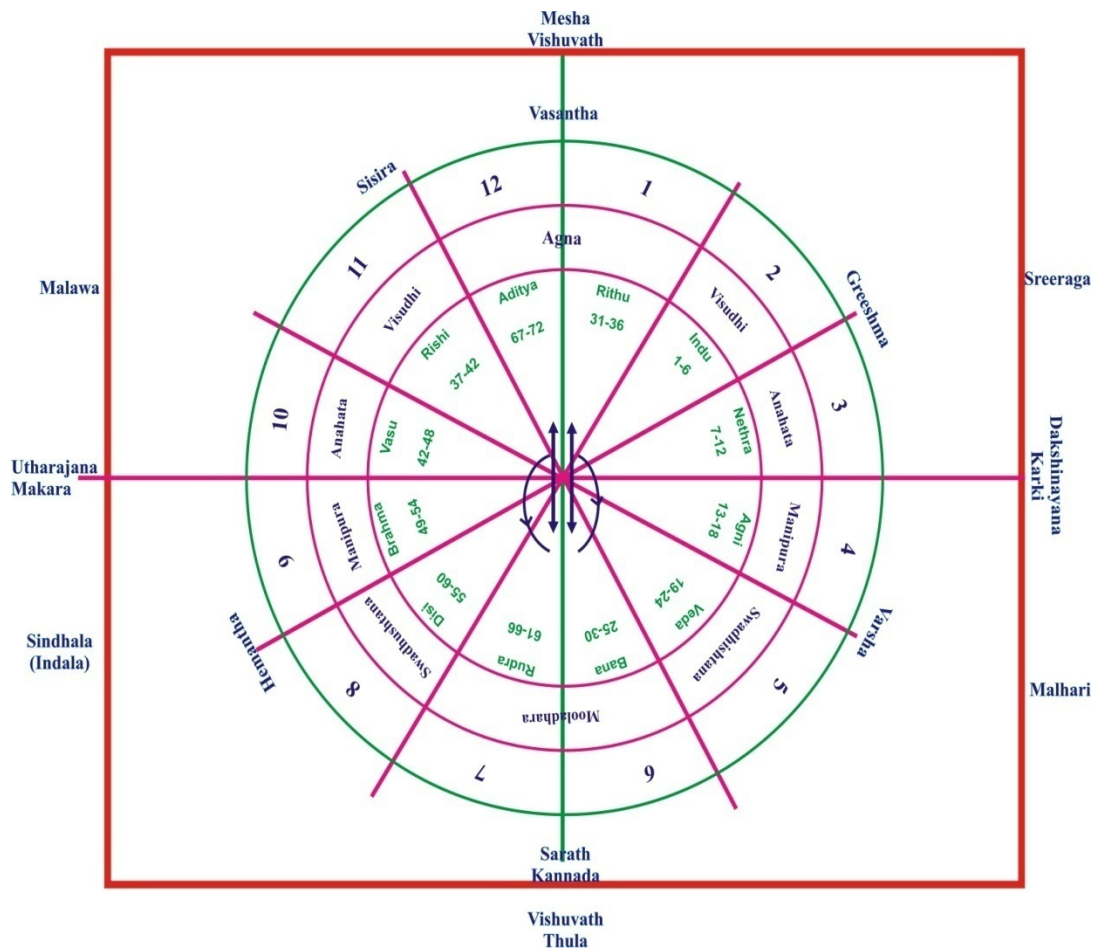


Fig 6. Chakra in MT Incorporating cosmic and human *naadi* /N & S India .(Nalapat 2003 ; 2008 a)

Using this integrated chart *Nadi* , meridians and energy channels used in India and China are also integrated.

Jung(1976) understood *chakras* as universal .Several supportive articles and books on *chakra* and energy in *naadi* have come out (Brennan ,1988;Idou ,2001;Shang 2000,2001;Rao and Motoyama 1993;Gallo 2002;Popp 1998;Vijk and van vijk 2006;Gerber 2001;Gilchrist and Mikulas 1993;Maslow 1954/1987). But none of them explore the underlying science, philosophy and integrative power for healing purposes .Anna Van wersch , Mark Forshaw and Tina Cartwright (2009) has rightly said that the concept of *nadi* and *chakra* in Indian and Chinese Medicine would be the most fascinating and worthwhile research topic . With my medical training, love for music , philosophy , astronomy and yoga , my journey had indeed been fascinating.

An interdisciplinary integrated result-oriented approach integrating doctor's and client's point of view yet client-centered there are no known side effects if music is used in correct sound decibels . The discipline works on principle of *Ayurveda*(*Thridoshasidhantha*), and *Yoga* (*Naadalayayoga*). It is a cost-effective procedure and reduces dosage, duration of hospital stay for surgery- a boon to majority of people of India since exorbitant rates of superspeciality hospitals are unapproachable to the poor and middle class .

*Swara* with *thriguna* balanced increase psychosomatic balance and immunity . The balancing is done by time, seasons, day, night and cosmic and bioenergy harnessed for balancing life . It combines spiritual traditions, with science , *ayurveda*, *jyothishasasthra* and modern medical knowledge.

(Spirituality,physicality,aesthetics,mathematics,music ,and astronomy are integrated ).Follow the principle of documentation and evidence-based practice , research tools and protocols and discuss , evaluate on-going projects , have an open outlook for growth of the discipline . Statistical evidence and data compilation from various centers should follow as a metascience.

## 2.3 Physics of Acoustics

Above 80 to 180 dB is noise pollution level . Instrumental music starts at 60-and upto 80 dB range and vocal music has range of 20-30 dB. At 10 dB we have breathsounds alone in *praanaayaama* (*yoga*) and below that is usually inaudible to human ear.The zero level is the silence and the *yogic naada* level zone.Because of this human voice is best suited for therapy .If instrumental music is being used adhere to the levels well below 60-50 dB and several traditional instruments have this range .Thus side effects are eliminated.

## **2.4.Key issues:**

**2.4.1.**Clinical Governance issues ,regulations, training quality assurance for an integrated curriculum using music therapy for medical institutions.Worked out and experimented in Amritha Institute of Medical Sciences and Research center.(Nalapat 2008 )

### **2.4.2.**Can MT be used in mainstream healthcare system?

Reduction of stress and anxiety and effect on pulse pressure ( modifiable causes of coronary heart disease , a major problem in clinical practice) was proved. .

Experimented with patients having cancer therapy , for reduction of pain and for acceptance of disease with positive outlook , and for reduction of stress in clients and relatives, Reduction of stress and anxiety in professional and normal people for a better quality work environment and productivity. If life is suffering , survival is to adjust and cope with it , and success is to adapt effectively and creatively. Management of stress and stress-related disorders are gaining importance in the present day world of personal and professional stress and the most effective tool for stress reduction is music and arts .The management of stress is derived from Eastern practices of relaxation,visualization,*Yoga,Taichi*,meditation (Anna Van Wersch 2009.)

In a similar context people do react differently and therefore stress is different in different people faced with the same stress condition.Hence the SRRS Scale (Social Readjustment Rating scale) by Holmes and Rahe (1967) is being questioned (Scully et al 2000).Psychoneuroimmunology (Ader,R 2000) studies are showing how the eastern philosophies for stressfree healthy life were useful and scientific . Palsane and Lam (1996) highlighted distinction between western negative connotation of stress detrimental to health and eastern perspective where stress is life's necessary challenge. The different humanistic values , cultural values are inputs through which people view stress and react to stress. (Wong & wong 2006; Laungani 1995). Laungani identifies Cultural variations along

- Individualism vs collectivism
- Cognitive vs Emotionalism
- Free will vs determinism
- Materialism vs spiritualism

Hoefstede (2001) studied the two ends of the spectrum (study in 64 countries) . In USA the most individualistic where man has concern for oneself , and China and India as the most collective with concern for whole community/whole. Anna Van Wersch (2009) specifically says by “eastern” she means Budhist, Hindu and Taoist , Confucian systems. Indian music is a wholistic , collective healing approach for wellbeing of entire creation. (Nalapat 2008)

Hunger, thirst , external fears from dangers are stress for any living being. They either fight or think for finding out a solution to cope with it or flee from it , avoids it . Homeostasis is a three stage stress response demonstrated in general adaptation syndromes . When the efforts to survive fail, the system gives out an alarm resist and if exhausted die/perish. These are reflex actions. Humans have , over the reflect actions, the competence and behavioural ability to cope.

- Primary appraisal:- The scanning of how harmful the challenge/threat/stresser is .
- Secondary appraisal :- Seeking possible solutions and how best to deal with stresser.

This dynamic process continues and the problems as well as the emotional focused form of coping , and coping styles differ in different persons and per situation ( cancer, colonoscopy ,death of spouse etc ). How to assess each individual is therefore a challenge and one cannot generalize on biomedical model alone. One method is write down in client’s own words and from those individual reflections assess , as part of narrative medicine in which music life panorama (MLP) helps.

In eastern philosophies dichotomous thinking , paradoxical phenomena occur simultaneously ( internal and external control) and is a multiple dimension of the one. Multiple ways of appraising, coping with stress at the same time is possible for the whole. Thus obstacles in life are seen as ingredients for healthy development , for learning from experience and life gives both personal and professional expertise and experience.

Fig 7 Outcome Multifactorial



All the factors affect outcome of therapy and no single modality can boast that it is the sole guardian of health. .A combination of

therapies depending upon the individual's needs (disease, personal choice including) is best. Music life panorama helps to find this.

Our cognitive states produce and modulate emotions and emotional states in turn influence cognition. We can understand it linking to neuronal functions. Neurophysiology, neuropsychology and fMRI (neuroimaging) and computational neuroscience has made it possible to understand these. Neurophysiology is at a single neuron level information exchange awareness. Emotion is beyond even the brain level at the evolution level and at genetic level. Thus decision-making touches a new realm of neuroeconomics. A contrast between the function of orbitofrontal cortex and amygdala happened during evolution of emotion.

- What motivates us to +ve emotions and health? (Edmund T Rolls .2007 )

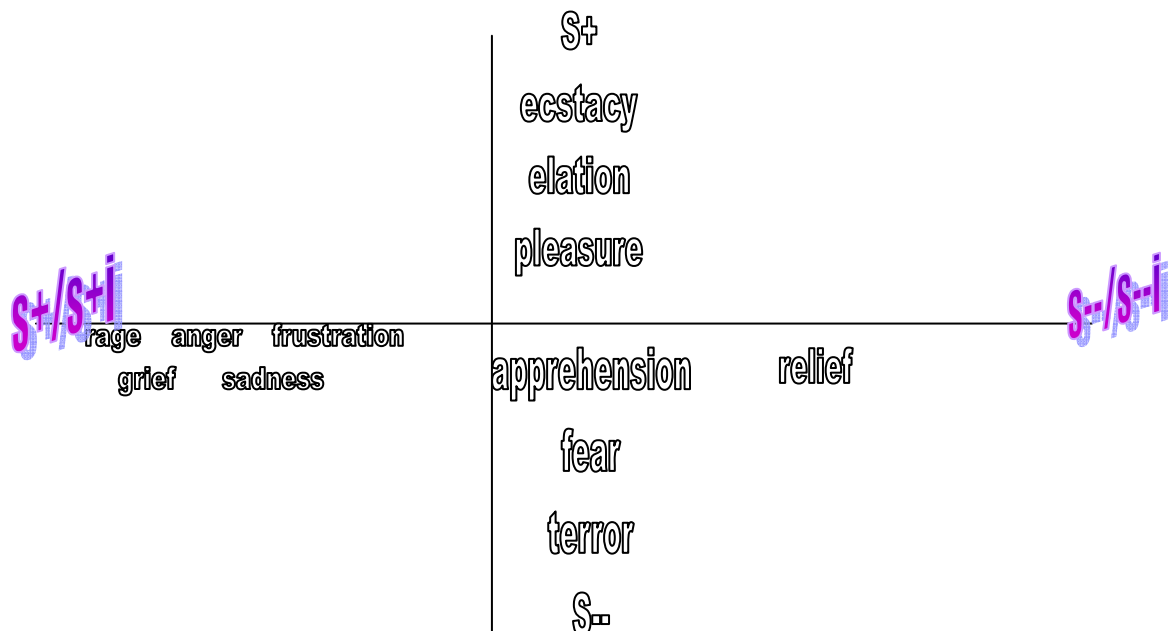


Fig 8 Motivation of +ve emotion by chosen music

$S+$  is delivery of a reward

$s-$  is delivery of a punishment

$s+/s+i$  is omission of reward/or termination of a reward

$s-/s-i$  is omission of a punishment/termination or escape from a punishment

vertical axis is reward delivery on top and punishment delivery down. Horizontal axis is nondelivery of expected reward (left) and nondelivery of expected punisher (right).

Cognition and emotion mutually influence each other..

Giving an opportunity for high level linguistic thought at educational levels we are thus improving models by conquering the negative reinforcers . And a person more balanced and more cognitive will be more happy and more successful . A society based on this principle gives education on these lines , both in regional languages and in a common academic language and symbols (script) which everyone in a vast territory like India can understand for communication . Earlier it was Sanskrit..The British were able to understand the importance of this educational policy and they introduced it very successfully all over the world substituting Sanskrit with English.

Music evolved from a system of nonverbal communication that enable the emotional states to be communicated to others.The sthobha of the vedic language is evidence for this. Lullabies of mother gives emotional message to soothe baby. The prosodic quality of the human voice expression is part of emotional communication system .The brain system is activated by prosody. Women engage in prosody even while engaged in their household chores. Agricultural farmers engage in prosody while doing the chores. The intellectualization by linguistic-syntactic-processing contributes further aspects to music for emotion transfer. The music and language of the mother soothes best , therefore use of regional language in music therapy is essential.

Solving a problem by intellect itself is a reinforcer as a result of evolution of human brain.By language system reinforcement abilities educational pursuits , mental abilities and selections naturally follow. Once language enables rewards and punishments to be intellectualized , and problems solved with language , mathematics , or music it becomes a rewarding reinforcer and the behaviour is altered and ability/fitness of brain maximized. Indian classical vocal Music and visualization technique , on the modifiable factors of coronary heart disease caused autonomic response in heartrate , emotion , BP, relieved stress explaining brain mechanism of emotion as :



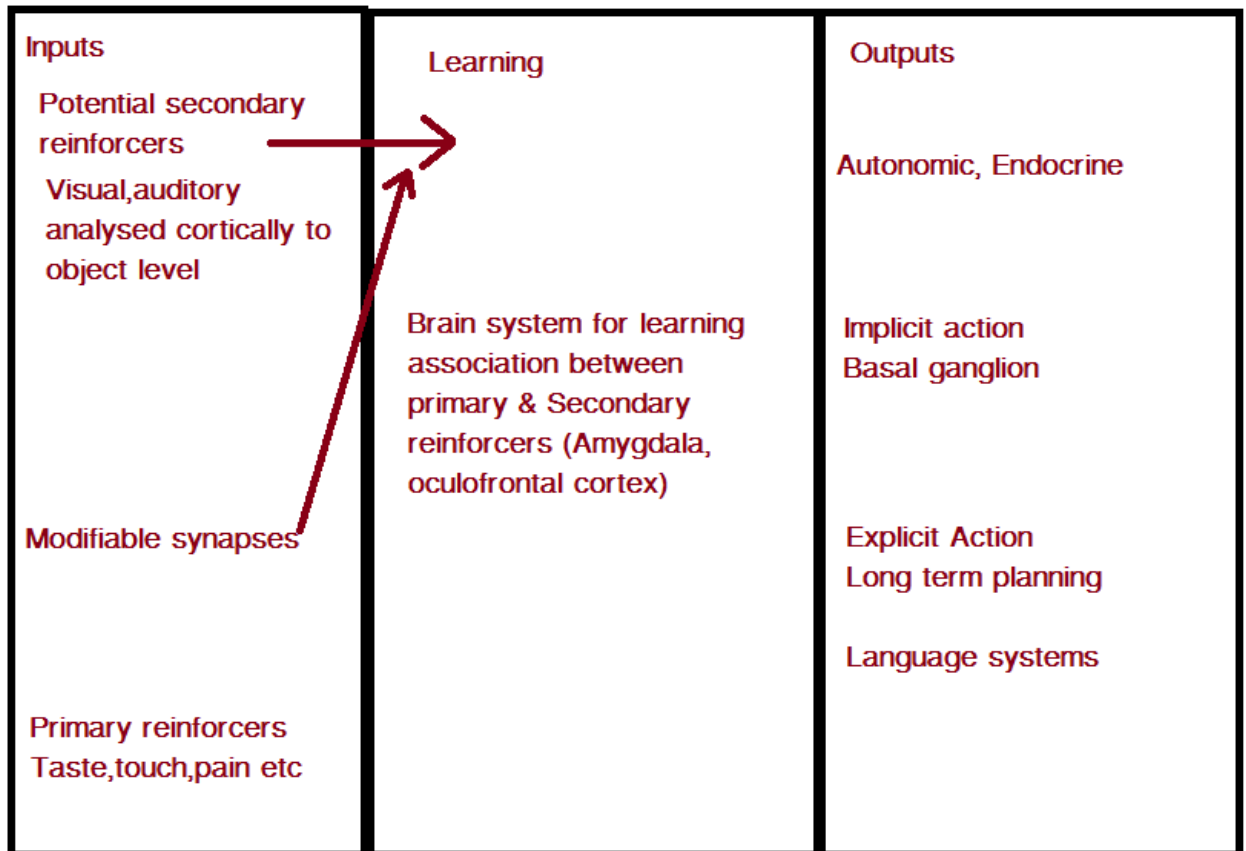


Fig 9 schematic explanation of brain mechanism of emotion and learning reinforcement by visualization of Indian classical music (vocal)

Seeing a loving face, hearing a loved voice orbitofrontal cortex gets positive reinforcements . For voice , amygdala and cingulate cortex also plays a role to identify the emotional expression in a voice. The Pavlovian conditioning with potential to create association between conditional stimulus (CS) and unconditional stimulus (US). The conditioned stimuli become affects and responses as associatively learned skills and is given to the world by each individual and hence by each society. The central affective or emotional states like fears, depressions etc are also given to the world by individuals. Which one we should accept and learn and give back to posterity depends upon our level of learning, cognition etc. Therefore what we hear has some importance in what we give back to society and selection of the

best music and giving awareness of it to each client is important.

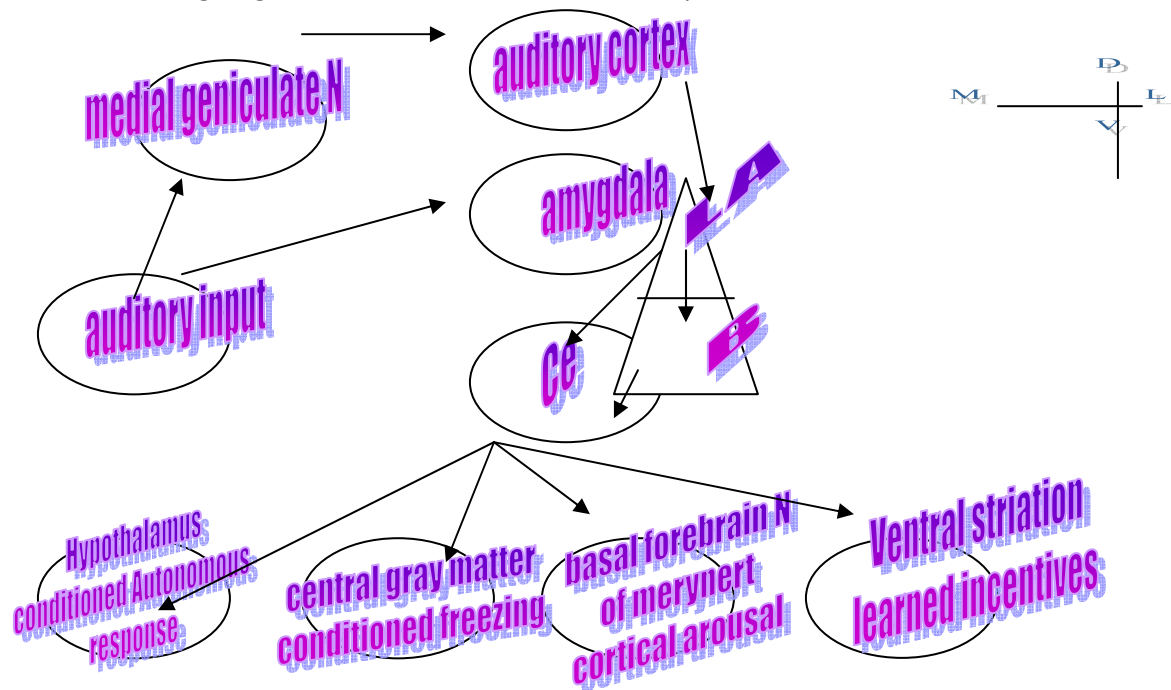
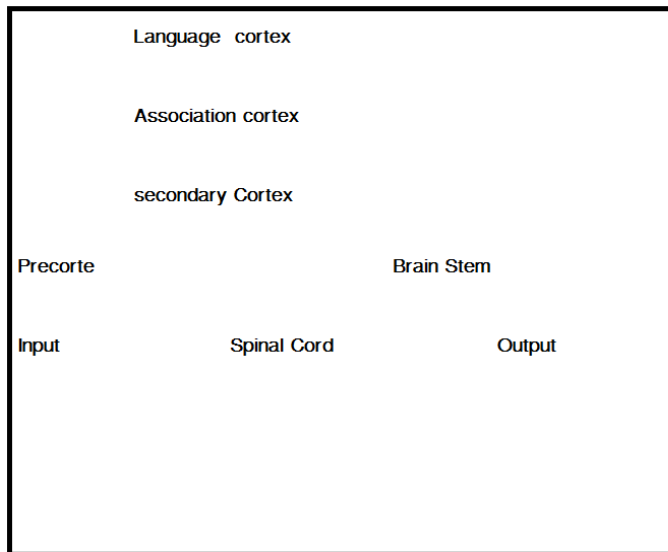


Fig: 10. The pathways of Auditory stimulation

Dopamine and electrical selfstimulation of brain leads to both reward situations as well as addiction responses . The reward to music and addiction to drugs are not the same, though performed by the same centers in the brain .Language system elaborate a coherent account of why and how a particular action is performed.



The behaviour of fighting and killing and scheming for possession of woman, property, territory seen in all lower animals and savage men, is not the best behaviour for peaceful survival of human race . Practical application of this wisdom in life is *ahimsa* (nonviolence) tolerance and truth . Any people or society which recognized this truth has to be considered the best friend (*Mithra*) of entire humanity and one who has achieved a neurological balance . Saamaveda used music for this *shanthi*.(peace)

Understanding one's psychology is not merely learning theories and recalling them/ passing a test / getting a degree / job. One has to fathom one's own mind and know it .Education means this understanding of the self.

- Adoption of a research approach. Why did I adopt it ? And how ?
- Appreciate the intellectual excitement of each new discovery. Of human passion that go to make up a scientific discipline and a discovery . Enjoying it .
- Know the true significance of these . Is it by part of my *jagrad* state of consciousness alone ? Is it helped by processes in dreamsleep, in imaginary visualization of a possibility and creation of it , and states of consciousness in dreamless state of *sushupthi* ?
- Is it a combination of all these ? And beyond ?
- If beyond what is that beyond , transcendental state ? (*Thureeya*)

Questions like this lead yoga/music therapist to

- Understanding of ourselves and of others
- The understanding of others about us which vary with their nature
- Beyond these two types of understanding what we really are . That is called the *Athman* by Yogi.

Fragmented understanding of ourselves is what makes psychiatry a fragmented discipline. The gaps have to be bridged in western psychiatry and mind viewed in its entirety and *Athman* perceived.

To understand, learn first (Episodic learning). Know the best way to learn (a complex logic). Organize a learning programme /a syllabus /curriculum of what and how to learn in a specific time frame. Naturally it becomes a planned management. A semantic form of learning develops. That is in language psychology a scheme developed which serves as a guide and organizer for further knowledge acquisition for oneself and for posterity (eg *Gurukula*). Having a wholistic conceptual overview promotes positive affective reactions. Behaviour will be effective learning in any new environment or challenge. Albert Einstein's advice never to regard study as duty, but as an enviable opportunity to learn is the bottomline.

**.2.4.3.** Evidence for effectiveness, Safety and lack of side effects, Cost-effectiveness: .client satisfaction worked out by pilot project (Nalapat 2008 b;c) at Amrita Institute.

A trial training at Trivandrum Pankajakasthuri Ayurveda medical college had several problems encountered due to problems in selection of faculty. These were analysed and a Faculty training programme devised as second stage of action research. Meanwhile a Randomized controlled study on 78 patients in Calicut Medical college undergoing colonoscopy was done. The dose of drug Midazolam could be reduced and the pain and discomfort zones showed significant variation in test and control groups. The music used was 56 % Raagabased, of which 46 % was vocal and 10 % instrumental. (Harikumar, Mehroof Raj et al 2004 quote. Nalapat .2008 c). Majority of ragas which caused this were belonging to the *Mooladhara* of the *Melakarta* scheme, and the ragas were selected by the patients themselves without any intervention by the doctors and without considering the *raga*. The site of colonoscopy being supplied by the *Mooladhara naadi* system, this finding was a very positive landmark in research since the clients themselves had selected what suits them best. The doctors were only mediators and researchers.

### **3.Training:-**

Common standards, accredited training involving extensive field and hospital based projects and teamworks, courses at University level, Textbooks as learning material for prospective students are needed for the next step of implementation.

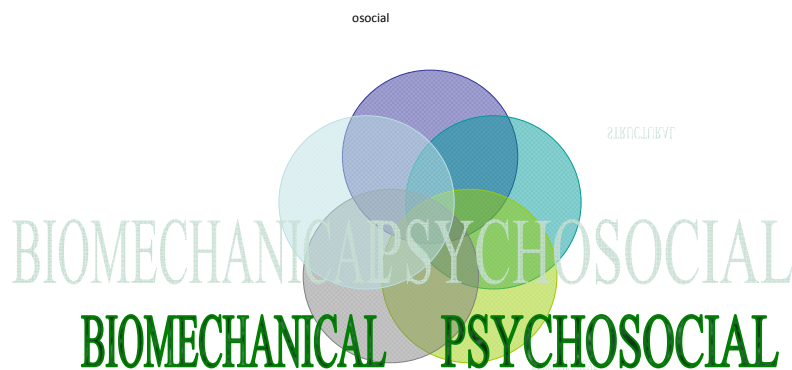
Training Faculty members for teaching and research work as an integrated team of experts (programme at Calicut University).

The curriculum and sadbhavana lecture series for Medical students (undergraduates) submitted to Amrita Deemed University and experimented first at extracurricular and then at curricular levels. Project for setting up a chair for Music Therapy Research with a postgraduate Medical doctor with experience in Music Therapy as Chairperson and a Musicologist with PhD in Music as Asst Chairperson was also

submitted to M.G University. These are the initial steps undertaken for fulfillment of an integrated

approach.

**STRUCTURAL**



*broaden and deepen diagnosis*  
*encourage selfhealing*  
*inform,empower,support clients*  
*improve practitioner wellbeing*  
*extend range of interventions*

Figure 11. Structural and functional basis of Integration

### **3.1.What leads to Successful Integrattion**

- Demand from public/Patients
- Committment from High level staff in the organization
- Protected time for Education and Communication
- Ongoing evaluation of the service which will help to defend service in the face of financial threats
- Good linkage with other establishments. Both Conventional and unconventional. For Integration this is essential
- Realism and good will from all parties concerned
- Jointly agreed guidelines and protocols
- Support from senior management /Health authority
- Careful selection and supervision
- Funding from both Charitable/Voluntary sectors and corporate sectors along with National/State funds and support for Regulations.

### **3.2 Designing an integrated service:-**

- Mainstream practitioners need appropriate referral guidelines based on need and evidence
- Public and public sector need well educated professionally regulated therapists
- capacity for research and creation of large outcome data sets require development of competent networks of practitioners and researchers
- Organisations involved must be capable of collaboration and reflective practice
- Reflective practices require development of systems for data collection and consistent methods for reporting outcomes

As an academic field the development consists of and depend on:

- Further development of Interprofessional ethos
- Appropriate interdisciplinary referral activity and reflection
- Ways of improving access and optimize relevance and effectiveness of it
- Practical approach to evaluation that reflect everyday practice
- Evaluation of processes and outcome relevant to client's and student's needs
- Continual clinical learning cycles to improve delivery of service
- Appropriate action on reflection to optimize professional and practice development

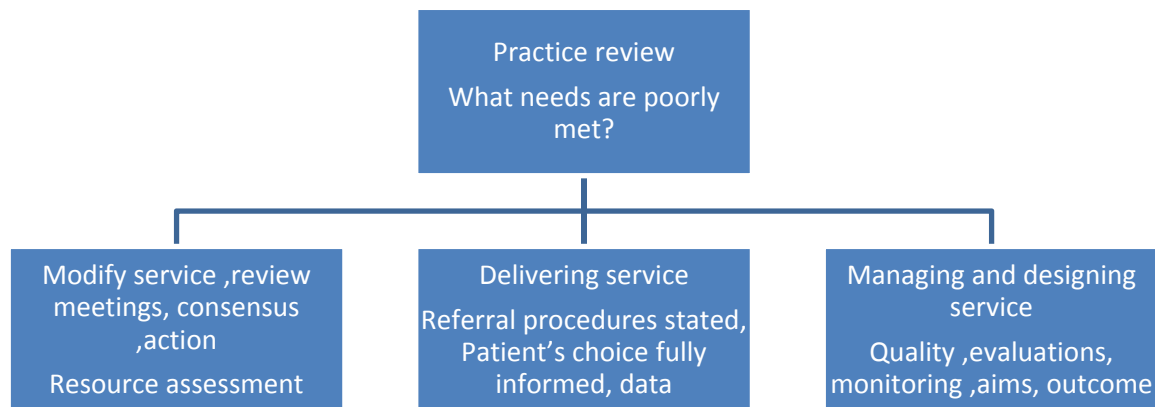


Fig :12.THE ACTION RESEARCH CYCLE

Information sheets on management of common disorders should be made available.

Reference to Modern Medicine,Ayurveda,Sidha,Naturopath,Nutrition counsellor,Homeopath,Music therapist, Yoga Meditation programme whichever patient prefers and is suitable.

### 3.4 Designing Information sheets,Reference sheets ,self help sheets Model:

Data entry use
Referral ID
Name
Address
Day time telephone
e-mail , other identification details

IN-HOUSE CT REFERRAL FORM



Date                      Referring GP

If referring to specific physician Name

Therapy requested (tick one)

Problem details (Tick relevant )

Homeo

Ayurveda

Yoga

Musculoskeletal pain    head & neck,Back,osteoarthritis,Rheumatoid arthritis,myofascial pain ,any other type pain

Allergies ,intolerance    Asthma,IBS,Rhinitis,Hay fever, others specify

Stress-related problems:Migraine,nonspecific GIT,Anxiety,Tension,others specify

Complex chronic illnesses Specify .

persistent pains or fatigue syndromes .

Women's health    Dysmenorrhoea,post or perimenopausal

Malignancy and toxic effects of chemotherapy

Diabetes,complications, Alzheimer's disease and dementia

Mental retardation ,Children with special healthcare needs, Cardiovascular disorders

Other problems to be specified

Presenting features and short clinical history and progress of disease

Aim of referral :-

Advise GP

Advise client

Diagnosis

GP Complex case

Patient support

Treatment

Research

Not otherwise specified

Background information, Anything relevant, comments about the physical and mental states of clients which require caution

#### CP NOTES

Date

Symptoms

Worries

Evaluation

Treatment

Outcome

Date

Symptoms

Worries

Evaluation

Treatment

Outcome

Date

Symptoms

Worries

Evaluation

Treatment

Outcome

Date

Symptoms

Worries

Evaluation

Treatment

Outcome

SUMMARY REPORT

Date

Diagnosis

Findings

Additional information

Treatment

Impression of outcome

Suggestions for further treatment/Follow up

### **3.5. Therapy choice questionnaires**

ID NUMBER

(To be filled in by patient)

Will depend upon the institution and the type of disease that is being evaluated and hence has to be worked out separately .Can be done with each institutions at first evaluating their needs and problems and likely type of clients they get .

#### **4. Evaluate likely problems**

- Financial insecurity
- Time pressure
- Lack of appropriate premises
- Unrealistic expectations
- Overwhelming demands
- Inappropriate referrals
- Unresolved difference of perspectives between different system practitioners
- Real or perceived lack of evidence of effectiveness
- Lack of resources and time for reflection and evaluation
- Lack of respect of other systems/other personnel

Try to overcome by systematic planning approaches

#### **5 Research methodology.**

Action Research (Kurt Levin 1940) is a style of research rather than a specific method with cycles of:

- Identifying goal
- Devising plan
- Carrying out plan
- Assessing outcomes
- Revising/changing plan according to needs
- Widening goal

Action research methodology integrates action and reflection, so that the knowledge gained with the inquiry is directly relevant to issues being studied. It helps the individual practitioners to develop skills of reflective practice ,help organizational members to develop a culture of inquiry, and emphasize on full integration of action and reflection and on increased collaboration between all those involved in the inquiry project. (Peter Reason , Center for Action Research in professional Practice school of Management , University of Bath).

Interpretation of research evidences:

- Do not jump to conclusions
- Try to distinguish between promising advances reported a scientific news and public health recommendations
- Keep your skepticisms in working order
- Notice where the information is coming from
- Use your own logic and common sense
- Be wary when studies are cited to sell you a product.
- Scientific studies gather evidence in a systematic way ,but they seldom prove anything .A proof means it indicates or suggests and is not a dramatic proof of anything
- And it does not mean that it is so in all people. It is so in some people .

These guidelines from the Wellness encyclopedia 1991 will help us understand where our scientific proofs are leading us. Especially in case of healing art , we are our own guides/our own healers /or decision-makers.

## **6.Job opportunities**

The new workforce created as Music Therapists can work as health Assistants in hospitals and teaching institutions (as caregivers,teachers,research Assistants) and in day care centers and clinics. This will not be as a substitute for regular doctors . It is as a support system to give more time for the client so that the history and material collected by the music therapists will be of much use to the clinician for his/her clinical planning and client satisfaction. In a busy schedule of clinical practice , the doctor will find this support to better his/her clinic/hospital oriented practice to integrate with client/family oriented practice and that will give him/her better results with the regular clinical practice.

At the same time the Human resource of the nation is being mobilized for better healthcare through family/client /community /social oriented narrative medicine practices and integrated and collaborative team work . This will bring arts and sciences on a common platform integrating both for betterment of human values and social research .

Musicians and music graduates and postgraduates will get opportunities to serve nation in a mass scale for their own as well as the community's welfare. In Japan Riko Ikkuno (2001) had tried a mass

movement with music therapy with people's support and support from all concerned and such a sociopolitical and spiritual upliftment by linking art and science (integrating right and left hemisphere function in each individual) is possible through Music Therapy . Music functions as diagnostic and therapeutic tool simultaneously .

**7.Conclusion: On what evidence I recommend Music Therapy ?What is the strength of the recommendation ?**

Category of evidence	Strength of recommendation
1 a .For metaanalysis of RCT 1 b.from at least one RCT	A .Directly based on category 1 evidence
2 a.at least one controlled study without randomization 2b at least from one other type of quasiexperimental study	B Diretly based on category 2 evidence or extrapolated recommendation from category 1 evidence
3.Nonexperimental descriptive study ,such as comparative study ,correlative study ,case control study	C.Directly based on category 3 evidence or extrapolated recommendations from category 1 or 2 evidence
4.Expert committee reports or opinions or clinical experience of respected authorities ,or both	D Directly based on category 4 evidence or extrapolated recommendation from category 1,2 or 3 evidence

Thus we have the strength of recommendation of Music Therapy for integration of health modalities.

India has a traditional individual and group music therapy , the integration of it into the national healthcare system , as valuable link to integrate all other systems has not happened so far. Individual music therapists are working here and there but without any definite guidelines and control. These

could be brought under a common platform and utilized for making the integration possible. The greatest obstacle for integration of indigenous and western medicine had been not due to any theoretical or practical loopholes in efficacy of Music.

One of the reasons is commercial . Each branch thinks that the other is enmical to it or is substandard . Systems shut in its own closed walls refusing to study what the others offer are separatists..Another reason is that practitioners are afraid of loosing their practice. Music is a unique trait of man and every individual has at least one time or another listened to music and experienced its selfhealing effect .This experience makes it acceptable to all practitioners and clients-whether indigenous or not. This is the greatest positive factor which will make its use as the integrating thread possible apart from the scientific reasons listed.

Science is not biomedical alone but energy mechanisms of modern astrophysics and its applications in biomedicine has proved the wave mechanics in biosphere and cosmic fields . This is the basics of *Yoga* and *sidha* and *chakra* medical practices well explained in both *Yogasuthra*, *Ayurveda*, *Sidha* traditions and in Indian Musical traditions and now experiemented in western medicine with positive results.If Indian doctors practicing western Medicine in India fail to recognize their own intellectual heritage and raise to the occasion with positive approach towards research, therapy, educating the public and taking up the challenge of responsibility of national integration and Human resource development through this most ancient and most effective tool of universal nature, we will be failing in our duty as a enlightened citizens of India .

William Osler , the famous pathologist remarked that Medicine is a noble profession for those who are noble in it.My modification : Every profession is noble for a person who is noble . Let us as doctors, educators, teachers, social scientists and social reformers , artists and musicians join hands as an integrated team and make the dream of physical , mental, intellectual , spiritual wellbeing of the nation come true and spread the message of that *shanthi* (peace) to entire world .

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(This paper was presented on 13.1.2011 at New Delhi, India habitat center in the world educational and cultural congress organized by Sruthi foundation and British high commission. Representatives from 39 countries participated and key areas for educational reforms were discussed. Several dignitaries including Dr Karan Singh, Honourable minister Sri Kapil Cibil attended the function and their views on integration of arts and science for value-based education and human resource development is a positive note. Hope at implementation level this will materialize soon.)

## Chapter 2 Listening skills in music therapy

The process of listening is highly valued in psychotherapy and music therapy for both clients and therapists. Listening skills are needed for hearing the expressions of other people, to tune into the rhythms and inner messages that come from our self. This listening process is not simply directed to what the person says. The subtle features of sound expression, the texture, pitch, tone of speech, convey more emotion than actual words used. As with musical expression, a person's style of speech is a projection of personality. Sound improvisations with voice and instruments often parallel speech patterns. ***A person whose speech is highly controlled, mechanical, and unexpressive of feeling will typically follow a similar course within sound improvisations. The***

***same is true for individuals whose speech is compulsively guarded and repetitious*** .( Q:The Arts and Psychotherapy by Shaun McNiff.;page 145).

Creative Listening skills are essential for all therapists, especially those who work with sound and music. The development of ability to listen to self and to others is the goal one has to set for being a good therapist. Within therapeutic musical dialogues we have to encourage each client to participate in an ongoing process of sharing verbally with each other what they heard being expressed in their respective sound improvisations. Intellectually sophisticated clients can in this way sustain a process of sharing observations with each other. This sharing process , directed towards understanding the subtleties of sound expressions, also characterize one-to-one psychotherapeutic sessions.

As with visual and tactile perception auditory acuity is developed with analysis of structural qualities of sound expression. Encourage discussion of feelings evoked by a music, the similarities and differences between sounds, patterns, groupings, time intervals, rhythms, etc so that the entire group shares their views on the music listened to and get benefited by that. Emotional qualities when discussed, sharing the feelings associated with a particular music sung in a particular voice, and the emotional attraction felt by some voice other than some other voice etc will come up. Exercises of this kind are important for severely disturbed , withdrawn, or institutionalized clients who need structured and highly focused activities to become more aware and discriminating in their perception of sound. For perceptually disabled clients this is the primary focus of therapeutic process. With more socially sophisticated and expressive clients , auditory perception exercises serve an important purpose in preparing people to become aware of the messages conveyed through music in Psychotherapy. With musical expression, an attentiveness to and understanding of what we hear is integrally related to perception of movements that make sound. This integration of sense modalities applies to other arts where with possible exception of visual arts, sound perception and listening play an essential role. Listening is integrated with vision and the muscular movements of body in virtually all forms of communications through language. Therefore the analysis of how we perceive and respond to sounds of music, both emotionally and intellectually ,can make us more aware of how we are using our other senses. The process of listening to music and other sounds , in psychotherapy, focuses on how we project our feelings and past experiences into what we hear.

The therapist and client discuss the commonalities of their perceptions as well as their differences with open mind. This help us become more aware of our listening patterns and styles and tend to expand the modes of our auditory perception as we become more aware of what we hear and do not hear. We explore our respective attention spans as well as our ability to concentrate emotional energy on listening process. As with all sensory modalities we discover that the quality of our hearing is determined by degrees to which we can focus our perceptual faculties on the listening process. The perceptual development excercises with reference to sound are easily adapted to the other sense modalities . In addition to working with our perceptual acuity and ability to discriminate between different sensory experiences we explore memory faculties within the various sensory modalities and experiment with the transfer of perceptual configurations from one sensory modality to another.

With therapeutic use of music and movement expression, the perception of aesthetic relationship and meaning is an extension of personal emphasis and effort. Within the temporal realities of life, there is an ongoing flow of sound, music and movement with which we interact and through which we determine what will be perceived. Psychotherapy in musical sense help us to be more aware of this process and become increasingly effective in responding to stimuli of environment .The philosophical approach to sound and music therapy is that all musical expressions are integrated with, and helps us to become more appreciative of , the qualities of sound and rhythms in our daily life. The inbuilt integration of all *Bharathakala* in India and the astrophysics and nerve plexus *chakra (ayurveda/yoga)* are to be viewed as the most ancient way of integrated healing on a sound basis.Now in our expressive therapy work we have videotapes to assist our interactive sharing .And we have modern methods of collecting research data, storing them and integrating them and reappraising them for future use and if needed modification as a metascience. These we have to use and integrate the ancient art and science with the modern research methods and data collection . This is the task we have and for this we have to do small projects individually and in different institutional set ups, collect all such data, case histories and hold discussions and publish such data as a journal for posterity .

- Visual imagery :-

Narrating the visual experiences one has during a musical auditory experience is a part of narrative medicine. Another way of having a visual imagery is (for people who can draw or paint etc) expressing the thoughts as a visual art. I had seen one girl who does this with Hindustani Raaga. The Ragamalika paintings of Mughal times show human forms . The music of Jayadeva gives word pictures of music. What the western music therapists do is to allow suggestive imageries . This is having its limitations since we are then having a therapist-centered and not a client-centered approach.

The symbolic celebrations of dramatic presentations and other audiovisuals also are used in different ways by art therapy people. Therapeutic drama from lives of people is inherently therapeutic , and Psychotherapy is essentially a process of dramatic enactment according to Mc Niff (page 207). The theatre and *Bharathakala* and *Harikatha* with music has to be viewed in this way in India since ethnomusicologists should know the importance of such national as well as regional theatres for healing experiences of human beings. Human beings need such catharsis as well as learning through entertainment to keep them energetic, optimistic with valuebased living.The nation needs such healthy practices for physical, mental, intellectual and spiritual health and cultural unity . This was recognized by early ancestors of India but the new generations of academics just throw culture into a wastepaper basket which they call "Religion"and Hinduism . Sindhu is Hindhu for Persian pronounciation and thus Hinduism is culture of Saindhava people who lived in geographic area between Sindhu (Indian ocean) and Himalaya . And if we are against all cultural and art forms and history and philosophy of India , saying that it is anti-secularism we are killing ourselves and it is our cultural suicide. The Indian musical tradition has its base in *Saamaveda* and *Saamaveda* is part of our cultural heritage and the imageries used in music were related to our geographical and cultural peculiarities for healing . And it is surprising that when I give music for my clients and get back the written feedback from them I often find the same imagery of the ancients from the modern people.This living cultural experience is showing the living tradition of India.

For children the dramatic representation of music as short musical drama based on stories can be of use. This is also experienced in both normal and mentally retarded children and children who need special care. But for this, the parents, teachers, trainers and the elders who are with the children have to show involvement in the process. The child learns as well as enjoys the artistic representation and also shares his/her feelings through them with others helping intra and interpersonal intelligence development.

Below see some Listening experiments which you can try with students.

### 1. How to listen to the outer world?

Find out a quiet calm spot naturally beautiful. Either a park, riverside or any beautiful place. You can even make a room facing natural surroundings.

Focus your whole attention, listen to the natural sounds that come to you.

What different sounds can you distinguish? Are you aware of rustling leaves or hiss of the surf? What else can you hear? Birds? The hum of insects? A babbling brook? Ready your mind to open to the sounds that come from far away. A distant bark of dog, or a crow cawing. A boatman's song from far away. The sound of a child's cry.

Any sound. Listen. This world is full of sounds. It is our task to consciously distinguish the various sounds and train our sense of hearing.

### 2. Listening to our inner world

Find a quiet spot in your home. Sit down and relax. Make sure you will not be disturbed for a while. Consciously listen to the sounds your body makes.

Can you hear the rhythm of your breathing? What happens when you take a deep breath and let out it? Can you hear your heart sounds? Can you feel the pulse in different parts of your body? Is that having a rhythm of its own? Your vocal cord alone is not producing the music of your body. Allow your entire body to compose its own music. Know that you are quite an orchestra all by yourself. Enjoy the music within your body.

### 3. Listening with your intellect.

Play a record which you like best. This can be done in the quiet room you had selected earlier. Sit down or lie down quietly and relax.

While the music is playing ,consciously try to distinguish the various voices,the instruments, different pitches, melodies, rhythms etc.

Are there any sections which are too louder and too soft and how does it change your reaction to the music? Now you are using your intellect to analyse the music .

#### 4 Listening with your Intuition

Play the same music which you played for intellectual listening. In the same room . Be relaxed, sit or lie down quietly. But this time do not think or analyse. Just allow the sounds to wash over you without consciously listening to any detail but with full attention of an open mind.

With this exercise you are not only training your external ear but also your capacity of inner hearing. You will be aware of the feelings and sensations the music creates within you . It opens up to the world of sound and music and its healing effect. The intuitions within you is making healing by directly speaking to you . The intellectual analysis cannot bring this out .

#### 5.Test the vibrations

Keep your hand over your neck and feel the vibrations of your breathing.Then make sounds like OM and note the vibrations.Now sing the melody and note the vibrations your body makes with utterance of each musical sound.

Alternatively , keep a singing bowl on your hand. strike it. Can you feel the vibrations in your hand and palm? After striking , put the striker aside , hold your other hand above the bowl and feel the vibrations. Strile the bowl again and place your hand on the rim. The sound and vibration stop. Hold hand above the quiet bowl and feel the difference. Repeat and feel the difference of vibrations .

#### 6 A sound massage

Lie down on your back breath deeply three times and relax . Listen to the melody and try to visualize the sounds touching your chakra points and feel the vibrations within.

The lower tones usually work better for the lower chakra while higher tones work better for higher chakra. You can sing the swara and feel this . Lying down relaxed for a while enjoy the music and vibrations you felt without feeling any inhibitions. You are being given a sound massage . You will be transported to another world.

Come back to the here and now after the music as a refreshed energetic person , healed by your own massage without help of a second person.

7.A music and a story (dramatic) with dance which you have created or someone else has created is selected. Or you can select a manthra .Select a sound and pitch you enjoy best. Relax with the manthra or music or dance drama and find out what happens

Or alternatively you can attend a Kutchery of a favourite singer and enjoy the vibrations in your different chakras and get benefited by that

More than intellectual listening, intuitional and creative listening is needed for healing effect to happen

#### 8. Group improvisations

Every one has a favourite music. Let us have that. In a group we can share them. Speak about the favourite music and the feelings and effects it produced on healing . Have your MLP shared with others . Be prepared for improvisations and new insights from sharing with others.

Make harmony of ideas and of music together.

Every kutchery is a group improvisation and a group sharing .

9. The exercises can also be tried in noisy places and note the difference in feeling .

10 comparative study will tell you which is best for you .

11. Though you start with your favourite music first, be open to have the raaga music best suited for stimulation of your entire chakra and entire personality and healing . Music therapists can help you in this process.

Ref . Shaun McNiff : The Arts and Psychotherapy

- **Chapter 3**

#### **Cancer –Arbudha/Karkkaroga**

When I joined in Department of Pathology , as a diagnostician and an educationist to teach generations of Medical students to come , my tryst with my destiny had shaped itself. The natural history of a disease, its multifactorial causes and the limitations of the biomedical sciences and its strengths all came in multiple shades of knowledge and wisdom unfolding in a series of stages .

The first decade as Clinical Pathologist (1972-1980) saw anaemia, leukemia and multiple reasons for malnutrition and carcinogenesis from the environmental pollution, toxicity of chemicals administered in various ways, and the only methods of dealing with the problem as food self sufficiency in agro-economy so that every child in every village gets nutritious food at home ; and a pollution-free atmosphere-air, water and environment around. . When I wrote a novel based on these in late seventies, (Titled Kalindi) it was addressing all the problems and the possible solutions I may search for these . The next novel Yudham (The battle) was a war between cancer and the hospital team of clients, surgeons and

caregivers and also of a family of farmers who became industrialists, priests and doctors and the mental and physical conditions and changes associated with it . These books were having their background , Calicut Medical college, Wynad, Malabar and the river Chaliar and its pollution .The histories of leukemic children and of cancer patients (with different types of cancer) I have tried to depict in such novels/novelettes . The characters are real patients I came across but with changed names . 117 leukemia patients were systematically analysed for the epidemiological and environmental factors that had lead to the problem for the formulation of my theories.

The study of the birthchart of cancer patients was a project which we (Me and my husband) started together , but I continued alone later .

Organ	lagna	2	3	4	5	6	7	8	9	10	11	12
Breast 1	Virgo	-	V	Me, Mar s ,S	-	J				Sat		Moo n
2	Capr	Moo n J	Sat	keth	-	-	Mar Sun	V	Rah	-	-	-
3	Scor Sat Keth		Moo n		Mar	J	Sun V ,rahu	Mer				
4	Leo	Sun Mer	V Rah				Moo n		Keth	Sat		J mars
5	Virgo V rahu						Mars Keth		J Sat		Mo	Sun Mer
Stomach 1	Cancer Rahu					Mar moo n	keth	S V mer	sun			J
2	Libra					Moo n	mars	S		Rah	V	



										J Mer Sun		
3	Sag	J Rahu	V	Sun Mer sat	moo n	mars		Keth				
4	Gemi	Mar J		Sun Mer	V					moo n	Keth	sat
5	pisces			J mar	sat	V	moo n	Sun Mer	Rah			
Duodenu m /bile duct 1	scorpio	mars	moo n		Keth		V Mer Sun				J Sat Rah	
Gallbladd er 2	Sag J V	Keth					Moo n	Rah			Sun Sat mars	Mer
Rectum 1	Scorpio Sat		Moo n Rahu				V		Mer Sun Keth u	Mar J		
2	Scorpio Sat		Moo n				V		Mer	Sun	Mar J	
Oral cancer 1 tongue	Sag Keth						Rah	J	Moo n	Sun Mer V		mars

2 Tongue/ Lower jaw	Capric		Sat Rah						V sun Mar J Keth Moo n Mer			
3cheek /mm	Sag  J  V		Keth				Moo n		Rah		Sun Sat mars	Mer
4 larynx	scorpio		Mer rah	Sun	J	Moo n V		Sat	Keth u Mars			
5 vocal Cord	Virgo  Rah  Moon  Sat	J	V  Sun	Mer		mar	Keth u					
Lung 1	Capri  Sat  Rah	Moo n					Keth		mars	V J	Mer Sun	
Kidney 1	Virgo  Mar  Rah  Moon  Sat		V	Sun Mer			Keth u					

	J											
Eye 1	Taurus V	Sun Moon Mar Mer	Keth		J					Sat		
Famous persons 1 Throat	Aquari us Sun Moon Mer	V		Ket h	J				Sat	Rah		Mar
2 left eyebow	Libra	Mer V	Sn Rah		J	Sat	Mar	Ket Moon				
3Oeso phagus	Libra V	Keth				Mar Sat		Rah			Sun	J Moon Mer
4 Lung	Sag J			Rah Mar	V mer	Sun sat				keth	moo n	
Benign 1 fibroid	Libra Sat	J	mar		Keth	Sun	mer	V	moo n		Rah	
2 Lipoma	Gem Sat			J	moo n		Keth Sun		V			

	Rah						Mar					
							Mer					

Of the 26 malignant tumours 8 belongs to Anahatha chakra (5 breast, 2 lungs, 1 elbow)

7 to Manipura ( 5 stomach, on duodenum and gall bladder duct, one gall bladder), 2 to Moolaadhara (2 rectum) , 7 to Visudhi( oral cavity, throat, oesophagus ), 1 each to ajna (eye) and Swadhishtana (kidney) . The benign tumours belonged to mooladhara and anahatha .

The 2 cases of Rectal carcinoma had almost identical planetary positions and lagna which appeared significant . The person with cancer of tongue and lower jaw had a mandibulectomy and he had a very rare and peculiar combination of planets in 9<sup>th</sup> house aspected by Saturn and rahu in 3<sup>rd</sup> house and all planets were in these 2 houses with a very unbalanced position. Sage Parasara had given a rule for cancer to occur if virgo is Lagna and Saturn is with Mars . In one person with vocal cord cancer and in the one case with kidney cancer this rule was present .

According to *Devakeraaleeya* if a person is born in *Viswambara Naadi* with a Saturn in *neecha* or with 8<sup>th</sup> lord Mercury, body will be affected by cachexia due to *Karkaroga*. 3/5<sup>th</sup> of the cases given above were born in *Viswambaranadi* .

Another rule saying that 6<sup>th</sup> lord (when lagna is leo,virgo,pisces,gemini) if occupying 8<sup>th</sup> or 12<sup>th</sup> bhava will cause cancer was observed only in one case .

I was looking for any of these rules given in the above mentioned texts in the horoscopes . But I later on abandoned this study, because I thought it can create a sort of superstition among people and a panicky sort of fear complex when a child with such combinations are born. Already Modern medicine has created a fear complex on health diseases and if we add an astrological superstition on to that , the negative approach will increase and that is why I abandoned this research based on astrology halfway . There is no such danger with music therapy and it is safe in every respect .

The problem of giving *raaga* for *chakra*/organ /disease/*lagna* etc happen when we are dealing with a person already affected with a disease process and usually such people come to us only late, after trying out all the other techniques and in total confusion and at a point of no return. So what is the best method for us, the music therapists ? To have a system of self-healing taught as a lifestyle right from beginning. And if we have a *sampoornaraaga* musical repertoire which takes entire body *chakra* as a holistic manner and not as parts/imperfect organs , that would be the best for the health of entire society. The question is have we got such a good repertoire of *Melakartha ragas* for use in our patients ? In my case , in Kerala public ? The patients I get are Malayalis and they would prefer a *Melakartha Chakra ragas* in Malayalam , in a favourite voice of theirs. Thus started a research on Yesudas and his acceptability of my clients (both healthy and unhealthy) and I thought if he can sing all *Melakartha Raagas* for the benefit of the entire community it would be nice. But before that I had to test the *Melakartha Raaga* on a sample population . I did that only when I moved to Ernakulam and took up

position as Head of Department of Pathology at Amritha Institute of Medical science and Research center. Thus it took almost 20-25 years for me to test it on human clients in a hospital situation, after the idea occurred to me.

In between I had made a system of *Navavarana krithi* on *Mookambika* and studied *Soundaryalahari* and *Srividya/ Sriyanthra* /cosmic divisions of biological field . But I didn't test it , because *Melakartha* is more accurate musically and mathematically and astrophysically as well as biologically .*Navavarana* is more for the *Sidhi* except probably the *SarvaRogahara chakra* ( The *navavarana krithi* on this chakra can be used as a *dhyanasloka* of all Music therapists) . Moreover all the Nine *avarana* are represented and included in *Melakartha* and therefore we are getting both the effects with *Melakartha* .

The research which I did on epidemiology of Gastrointestinal neoplasms of North Kerala, on Kidney neoplasms, on the pigmented tumours , and on the Functioning Neuroendocrine tumours were all my efforts to learn more and more about cancer epidemiology and the effects of environment (both external and internal milieu) and its balancing by Neuropsychimmunological mechanisms .

When I moved to Amritha Institute , I had two of my students there . Dr Sanjeevan and his wife Dr Ajitha , both working in Palliative care/Anaesthesia /Geriatrics and running a family service (hospices) along with Hospital medicine. They were good human beings first and good doctors then. And sometimes Sanjeevan will call me and say , Ajitha wants to meet Madame and spent some time with you , because she is depressed over some patients who have been suffering too much and she could not do much help in such situations. That was not a personal stress but a professional stress for Ajitha who was very sensitive to human suffering , because she is a good individual with a compassionate heart . And they will come and sit with me and I will tell things relevant and irrelevant at times to take her mind off the sad events she had witnessed . Thus , Ajitha became a part of my Music Therapy project .She helped me in my project work .

Another person who helped me with my Music part of research was Dr Bhuvaneswary .She was at first very reluctant to sing *Melakartha Raga* because all the musicians had discouraged her to do so . But I showed her the results of her initial recordings on the volunteers, patients and on general public and slowly boosted her confidence and she got involved with all her heart and still continues with it .

#### Case histories:

1 This is the story of P and J . Two teenagers from two different families . Both had the same disease .

P was 19 years when he was admitted in the medical ward for very high Blood pressure which had been periodical .And he was a very thin boy with elongated limbs (which in medical repertoire is called Marfanoid features) and bright big eyes . The examination showed that he was having a very big mass in abdomen on one side .The mass was on the upper part of kidney arising from the adrenal gland . And on cross examination we could get a history of one of his father's brothers is having multiple swellings all

over the body ,which we call Multiple Neurofibromatosis , benign tumours from the nerves .The abdominal tumour was resected and the boy was well after that without episodic high pressure . He didn't have any neurofibromatosis or any thyroid tumours.

J also presented with the same symptoms but didn't have a family history of any predisposing disease/gene .There was a small nodule in thyroid which happened to be a benign adenoma.The abdominal mass was from adrenal and that was causing the sudden rise in blood pressure and surgical removal removed the symptoms.

Both these cases were diagnosed as Pheochromocytomas , which are tumours of Adrenal medulla categorized as functional Neuroendocrine tumours. The Marfanoid features of the boys , the episodic rise in BP and the family history in one case are typical of a partial MEN .(Multiple neuroendocrine neoplasia syndromes) .

The functioning tumours are a special type of tumours arising anywhere in body , and in endocrine organs, and producing symptoms due to certain neuropeptides and hormones .

What is significant of this type of neoplasm is that it gives us insight into several of our emotional and physical characteristics which are due to hormones/neuropeptides which in turn are somehow connected to nervous system . The Neuroendocrine system and its functioning tumours give us insight into the indepth nature of human functions and emotions , balances and imbalances which create health and disease . When there is imbalance we get a host of disorders and when it is balanced we are healthy and the balancing happen with a series of feedbacks between various organs, systems and cells .This is the ultimate of balancing health by homeostasis of numerous chemicals within body .The metabolisms and all other normal functions need neuropeptides and when this is upset disordered functions occur. The relation of nervous system, endocrine system and neuroendocrine system gives us more information about what the *Ayurveda* and *yoga* speaks of *naadi* and its balance of *dosha/guna* or of the sama(equalizing ) of humours and qualities (*guna*) which leads to our *karma/vikara* (actions/emotions) .

From 1975 to 1995 I had been seeing and collecting all the cases of Functioning tumours that came to Pathology Department in Calicut Medical College and studying them .

The lesions of Kidney which are mistaken for a tumour but is not a tumour , called Xanthogranulomatous Pyelonephritis , was studied for about 17 years continuously.

Another field I was interested in was Melanomas. The interest came accidentally .

In early 70's a man came with a small lesion in his right eye and that was removed and sent by the Ophthalmology Department. The lesion was reported as a Junctional Naevus by the then Professor . After 6 months Raman returned with a big mass in stomach and he had a secondary of Malignant Melanoma in both Oesophagus and Stomach . This is a common error that occur in diagnosis of

malignant and benign tumours of melanocytes.. The Calicut Medical college Pathology Museum might be still having the specimen of that huge tumour which we mounted and kept there .

In early 90's a technician from Microbiology Department had a black mole removed from his little finger .The same mistake was repeated again, though another Professor had raised the doubt that it is a malignant tumour . The man returned after a month with secondaries . Thus , the mistake of one generation was not of use to the next generation of Professors and Doctors. One can give so many examples like that where a Diagnosis went wrong , may be due to ignorance or due to lack of scientific acumen and facilities of diagnosis . Human error is possible in any branch of Medicine but when it comes to other branches of knowledge , Modern Medicine takes a very harsh view . We, always blame all other systems as fake/quack or unscientific . Though I am a person who has worked throughout my life in Allopathy medicine , I have always felt the injustice of this attitude . One important thing is that the other branches of medicine gets their patients only after all the Modern medicines fail and all the side effects of their medicines had been induced . Except for surgical cases , the rates of success of allopathy medicine cannot be considered as theirs alone . Most of the diagnostic methods belong to physics , chemistry, biology , engineering and IT etc as far as modern Medicine is concerned and one must understand these belong to entire mankind and not exclusive for Modern Medicine alone. .

Too much of ego and selfishness makes one look like businessmen and not compassionate Doctors . Knowledge of other systems of medicine is essential for Allopathy practicing doctors , just as the indigenous medicine people should know the research protocols of modern medicine . The aim of this is not for other branches to practice Allopathy and corrupt their own good practices with bad drugs and bad practices of allopathy. And it is not for allopathy to take away all the other methods into their fold and then claim that we alone are super scientists . Each has to know the principles of the other and respect it and try to understand the other . That is what I mean by integrated approach . Not a licence for one branch to practice another . But a broad base where each understands the other and respects the other at an equal ground. Principle of integration is principle of respect, love and tolerance for other people's views .

2.Meena had a squamous cell carcinoma of her cheek and that spread to her lower jaw and a hemimandibulectomy done . The face was disfigured and she could not talk properly and was sleepless and restless throughout after her treatment.The relatives brought her to me (at Ernakulam) one day and we sat and discussed the matter .What they wanted was a quality life for her at home and they requested me to give some songs that will give her proper sleep . And with the music I gave her (I gave her a recorded CD ) she was able to sleep . The relatives called me two days after. After several days of insomnia she slept well and the entire family also had rest . They had accepted the disease but wanted a quality life for their loved one and she had it at home and died a few days after .

Yesterday (September 19 2010) I saw a report in Medplus. That was by Maggie Fox from Washington (Reuters) September 14<sup>th</sup> . It reads as follows : Cancer patients who die at home do so more peacefully – and their caregivers end up doing better emotionally , too, researchers reported on Monday .(This was

abstract from the Journal of Clinical Oncology). Dr Alexi Wright of Dana Farber cancer institute in Boston after studying 342 terminal cancer patients and their loved ones until the patients died and after 4 ½ months later had given a report that if patients and caregivers were aware that the aggressive treatment would have affected their quality of life , as well as the loved ones they would have opted for other choices. They report that though most of the cancer patients prefer to die at home 36 % die at hospital and 8 % in ICU . PTSD (posttraumatic stress disorder ) was more common when patients died in ICU . 21 % of caregivers developed PTSD . Only 4.4 % developed when the patient died at home hospices . The hospital deaths were followed by a very prolonged grief disorder , an intense disabling form that lasted even 6 months . Home-based hospices care is for reducing suffering but in one study it was shown that the quality as well as quantity ( a little more longer life) was also increased with that . In the final months of life the ICU takes more than 25 % of Medicare expenditure needed for the patient and the patient could not see or talk to relatives for the last time . This made all the difference too.

In west , the scientists write this , because they are not having a ratrace for money . In India the situation is different. All blindly defend whatever is being done in their institutions thinking that they are doing their duty. Actually they are not doing their duty to their profession, institution, to nation, to patients or to the world and not even to themselves by such blind behavior.. They are just blind superstitious followers of a 16<sup>th</sup> century old concept that Western Medicine is an unshakable mountain of truthful science which is beyond all faults . We are becoming faithful mythologists ; Not scientists .

To give peace and quality of life to all living creatures, and to human beings is the first duty of any physician , whichever method he/she practices . Integrated medical service should give the facility for choice of medical practice to patient and a roof for all medical practitioners to come under that and know and refer cases to each other if need arises and that should be based on patient-centered care .

There should be an interdisciplinary team for intervention of the end-of-life care so that quality of life is improved and minimum stress is placed on patient and relatives . Dr J.Randall Curtis from Uty of Washington , Seattle tried to show an improvement in quality of dying experience as rated by the family and ICU nurses . The prolongation of time of life has to be replaced by the prolongation of quality life is the current motto and for that ICU and Hospital deaths are not contributing much . Family satisfaction and patient/client satisfaction in choosing the method of care they need is given under an integrated system .

American journal of Respiratory and Critical care medicine did a study between 2004-2008 . 6 hospitals were randomized for the intervention and 5 as controls. Medical records of 2318 patients who died in ICU was studied. The family rating of quality of dying was taken . The other parameters were family satisfaction with care, nurse-assessed quality of care, length of ICU stay, time to withdraw mechanical ventilation, chart-based elements of palliative care. The control and intervention group had no difference for QODD (quality of dying and death) assessed by family and nurses . The intervention was with social workers in randomized hospitals and they were withdrawn from control hospitals. That only



shows that the element was not by social workers but by the nearness of close relatives and the home surroundings (familiar) . The intervention did not increase or improve the doctors communication with patient's families .

Dr Curtis said that the target should be improved clinician behaviour so that they can build a complex and difficult skill of communication . And also that this should be implemented from within an institution with a strong level of support from bedside clinicians , ICU directors and Hospital administration. Without this support and without proper training of palliative care no social service can help the outcome is clear from this . But more important is about the skill of communication and skill of giving peace to the dying patient and his/her family . If the scientist think that he/she can give it with just her/his science they are living in fool's paradise . What I advocate from my experience is that personal care , love and devotional music gives all of them peace and strength and quality of life .

Another myth about selection of a doctor/and Modern hospital is recently unveiled by a commonwealth Fund study . The report say that the physician attributes as Medical school attended , years of experience, malpractice claims do not correlate with good quality care. Health care consumers are not choosing the doctors on such basis , says Anne-Marie J.Audet M.D; commonwealth fund's vice President (Archives of Internal Medicine ) . More than 10000 Masachussetts doctors were analysed with 124 indicators. Does a physician's characteristics and physician's performance match on various quality measures like giving proper medication and recommending the right screening tests and follow up care ? The result was the physicians attributes had little relationship with quality of care they provided , although board certification was mildly associated with quality . Patients need access to accurate , relevant data that provide an assessment of how physicians perform based on clinical quality measures .

On Sunday 13<sup>th</sup> September in the Hindu in letters to the Editor appeared a few opinions from readers on Humanity In medicine . They are given below :

1.C.R.Chandak .Hyderabad:-

While appreciating the need to introduce humanities in Medical studies , he feels it is equally important that medical students understand other areas of basic science ( For more Humanity in Medicine Sept 11) .A medical doctor has the responsibility of treating the patient as well as advancing knowledge of Medicine.Medical research is especially important for a country like India .One of the reasons for its absence could be that medical doctors are taught and trained for practice and hardly encouraged to ask questions or cultivate interests in interdisciplinary science. Removing the emphasis from science will further alienate the medical students .

2. M.V.SuryaNarayana Rao .Guntur:-

The modern materialistic world has made man a mammon worshipper. Doctors are no exception. Dishonest diagnosis, and treatment, nexus with middlemen, medical shops and pathological labs, and

reluctance to work in rural areas have become common . For doctors today, where is the time to read biographies, poems, and great works of literature? Most doctors working in Government hospitals have a private practice. Do they have the time to stand and stare at life ? It is unfortunate that some good doctors who still believe in values in the medical profession are dominated by undeserving and inefficient doctors.

### 3.Veenadevi Cheriya .Kozhikode”:-

Voltaire said: Doctors are men who prescribe medicines of which they know little, to cure diseases of which they know less, in human beings of whom they know nothing”. Medicine is a field that involves service . A doctor should have compassion and sympathy for his patients . The west has succeeded in combining humanities with medicine. But in India entrance examinations are a prerequisite for admission to Medical colleges . They are intended to interview the memory of students. Aptitude hardly matters.

### 4.S .Jayabose .Madurai:-

American medical schools require four years of college education , which often includes courses in humanities, social sciences, and arts, in addition to premedical curriculum .They prefer to admit students who have demonstrated their commitment to humanity through voluntary work. Since Indian medical schools admit students at a very young age ,a course in humanities will help them learn the essential qualities of a good physician. In addition , our senior doctors should strive to be good role-models for their students. They should listen to their patient’s concerns. Explain their illness in a simple language , give them the treatment options , and allow them to ask questions.

### 5.Anukrithi Kumar .New Delhi:-

A course in humanities cannot teach you to be nice to a dying man. If that quality is not already there in you, it never will be. As a typical critic of the education system , the writer is against memorizing . However in Medicine , the difference between knowing and not knowing is the difference between the right and the wrong diagnosis. Nobody can memorise everything a subject has to offer but the power to retain a lot of information and to be able to recall it under pressure is an essential prerequisite of the medical profession. What the patient needs from the doctor is his ability to cure . Science is all that is needed. I don’t care how he or she treats me as long as he or she treats me (That pun on the word Treats is superb!).

I just quoted these letters to show how different the personalities of different people are and also to show that both science and humanitarian considerations are needed for a perfect cure/healing . The basic sciences and medical sciences are taught in curriculum of all medical colleges alike .The humanitarian aspects are introduced in Amritha Institute of Medical sciences as a series of Sadbhavana lectures on Saturdays .(Music Therapy in management ,administration and education.Dr Suvarna

Nalapat 2008 .Readworthy Publications .new Delhi ). May be there are other institutions also which have such a programme. It is essential that each professional be a good human being first .

The statement of the last reader that the patient needs a cure from doctor needs a little bit of explanation . Does the client always expect a cure whatever is the disease and whatever is its severity and grade and stage ? Is there no responsibility for the client in keeping health and self-healing ? Is there no role for all citizens for the provision of good nutritious food for every child, a pollution-free atmosphere and water for a healthy life for all ? Whose responsibility is that ? Can a doctor alone take up that responsibility ? And about diagnosis and cure –just by learning medicine and without proper equipments for diagnosis and without proper medicines and proper education for public do we expect a doctor to cure every thing ? Is doctor a God ? And both medical and behavioral treatment of the doctor does matter for several clients just as we have seen from our own experience and from the American scientists reports given above .

I quote from Linda Blair , a senior psychologist and medical doctor , and a member of Medical research council at University of Cambridge .” It seems that we have become convinced that experts are the only ones who have the answers to our problems. We expect them to give us a diagnosis and a formula so that we can take it home with us much like a prescription , and then all will be well “ She continues to explain how her patient Gemma wanted to put all her troubles easily into the hands of an expert and get out of all responsibilities of a selfhealing and how she could help her to self-help by helping to change that attitude..(Linda Blair: Straight talking .Learn how to overcome insomnia, anxiety, negative thinking, and other modern-day stresses .Piatkus 2009) It is possible that at one stage in his life Anukrithi kumar also may see such an expert who will have a tough time for making him see reason.

Health of a nation and of the world is a collective responsibility of humanity . The medical profession is there not just to set right a problem when it comes. But all of us have to be humane to understand the causes and the solutions and prevention at various levels and try to be responsible participants in healthcare . The modern world demands that . And Modern medicine is not ultimate in any solution. Many of the ancient medical systems especially of India and China are getting more attention in west for its compassionate behaviour and positive effects . Therefore an integration of arts and sciences is needed for us to make things possible /to make transformation happen . Each and every citizen has to help in ecological protection, in water conservation and purification, in food sufficiency , nutritional requirements etc and also in the indigenous methods of healing for costeffective management and prevention of several diseases and sideeffects due to drugs . Ayurveda, Music therapy, Yoga , Sidha and visualization and Guided imagery techniques of devotion are being used world over by even Allopathy practitioners . The integration of arts and sciences have already begun and only a blind person will still say that only one method is Modern science and all indigenous methods are not science . A judicial appraisal of integrated medicine respecting patient’s choice and quality care requirements is on our problemsolving path . We will have to use it tomorrow , if not today .

Ref:

1. Anne-Marie J. Audet M.D; commonwealth fund's vice President (Archives of Internal Medicine
  2. Linda Blair: Straight talking .Learn how to overcome insomnia, anxiety, negative thinking, and other modern-day stresses .Piatkus 2009
  3. Maggie Fox Washington (Reuters) September 14<sup>th</sup> .Q. Medplus September 19 2010
  4. Nalapat Suvarna 2008 . Music Therapy in management ,administration and education Readworthy Publications .new Delhi
- The Hindu Letters to The Editor September Sunday 13<sup>th</sup>

- *Chapter 4*

## Music Therapy and behavioural neuroscience.

I had graduated in Biology and then in Medicine and for my postgraduation in Pathology ,I had taken up neuroendocrine tumours and their special staining methods. Because our pain, our emotions of love and anger and our behaviour are all related to the neuroendocrine system and its products . Why should I feel love for music, philosophy, God, and spirituality as well as to science? Because of a balanced neuroendocrine system would be a correct answer. Music therapy is part of a behavioural neuroscience programme . Behavioural neuroscience is a subdiscipline of both biology and psychology , and spans the breadth of neuroscience (Gallistel C.R. 1980. The organization of action. A new synthesis .Hillsdale ,NJ:Lawrence Erlbaum) which itself is a new discipline , a hybrid intellectual entity derived from a number of other disciplines , including physiological psychology , psychobiology, ethology, neuroanatomy, neurophysiology ,neuroendocrinology, logic, linguistics and philosophy.(The Neuroendocrine regulation of behaviour Jay Schulkin Cambridge university press 1999 Introduction pp1). Therefore it is quite natural for me to have an interest in this subject . My interest in Astrophysics and astronomy and its relation to musical theories of India also is a probable reason for this. In his preface to "The genetic theory of natural selection" R.A Fisher observes that the only difference between the

mathematician and biologist is the specialized extension of imaginative faculty in relation to the needs of the special subject they deal with , the intellectual faculty being the same . We cant forget that Gregor Mendel who gave us the laws of biological inheritance was a mathematician and his statistical interests lead to the laws of genetics in biology. There is nothing which is separate from the other . Everything is interconnected at the root .

Hormones influences behaviour by their actions in the brain.They exert the actions throughout the body .Biologists classify them as two distinct classes , The peptide hormones acting on cell membranes and steroid hormones acting on nucleus .The first class have rapid actions and the second have delayed actions but this distinction is blurred according to recent evidences. Both classes have profound effects on our behaviour. Peptide hormones are produced both in the periphery as well as in central nervous system. In the periphery we call them hormones and in the brain we call them neuropeptides. When neuropeptides are activated in brain, they stimulate neural circuits that influence behavioural responses. Hormones provide only one part of the story. Experience and genetic disposition also influence expression of our behaviour , hormonal secretion and brain function. Hormones influence how animals respond to environment , just as the environment influences the hormonal responses . Seasons, sensory cues such as temperature , olfaction, light and sound etc determine hormonal concentrations which in turn determine our behaviour. In several animals testosterone is seasonal and determine sexual responsiveness and territorial aggression. (Wingfield J.C 1994 Control of territorial aggression in a changing environment Psychoneuroendocrinology 19:709-21). The use of specific types of music for different seasons, for day and night etc are according to the cosmic as well as the circadian rhythms of the body in Indian music. The animal's place in social hierarchy can determine the levels of oestrogen, corticosterone and testosterone . (pp 2 Jay Schulkin). In order to survive and reproduce , animals spend most of the waking hours (Jaagrad) trying to solve problems of constructing a cohereant world in which to act and to determine its meanings .The hormones are the key tools in problem solving. They help passs information about the world and its meaning to animals. They also function as tools of communication of information between different individuals/animals. When aldosterone is elevated people are able to recall the sources of salt and use that knowledge to satisfy the sodium craving, which restore the extracellular fluid volume . Thus a hormone provides a link between a physiological problem and its biological solution. Homeostasis or maintaining an internal milieu is not only the balance of salt, water and mineral balance but also an emotional and intellectual behavioural balance too. Hormones are the key to adaptation and anticipates what the body, mind and soul needs before the item is actually needed. Animals spend their cognitive time predicting or anticipating events and planning ahead (strategy) and both anticipatory and reactive behaviours are needed to maintain homeostasis .The predictive sciences like astronomy/astrology, Medicine and their reactionary or practical sides (prophylactic/curative) thus makes a great advaitha of theory and practice .In India the history of music , astrophysics, mathematics and ayurveda are interlinked with the great samkhya, vaiseshika , yoga and advaithic philosophies . How our ancestors achieved this homeostasis had been my research and my central motive state . How did our ancestors reach Moksha /kaivalya and how I can experience that

state ? I was trying to solve that problem in my childhood. That central motive state lead me to Music and Nada concept.

What is a central motive state ? It is a state of the brain that is knotted to desire and experience and the action that leads to fulfillment of that desire. (Lashley K.S 1938 An experimental analysis of instinctive behaviour Psychol.Rev.45:445-71). The desire here is experience of Moksha and fulfillment of that desire is possible only with yogic Samadhi state . And in the process of fulfilling that central motive state I came across the six darsana, the astrophysics, medicine and music and other disciplines of the east and the west .Why was I attracted to music and philosophy right from my childhood days ? What makes me different from my siblings , from other people and animals ? What makes me similar to them ? It cannot be just the genes or the environment in which I grew up because several people share them. None of them think about moksha as their central motive state and try to fulfill that need. Thus , I experienced the real me , the Aham Brahmasmi which is beyond genes, environments, timespace and in that experience of Samadhi I learnt the real directive force behind my actions , my behaviour and my love for naadabrahma , the cosmic harmony of sound and light.

Functionalism is a characteristic of the problem-solving proclivities of animal life that is reflected by the activation of central state. The evolutionary consideration is apparent. Problem solving and adaptation are the hallmarks of functionalism amidst evolutionary pressures. Functionalism has two senses both rooted in biology. One reflects problemsolving behaviour internally and the other is external behaviour allowing the animal to adapt to environmental niches. For song sparrows adequate testosterone is needed during gestation, to make the adult sparrow have full expression of the song. Song reflects the induction of vasotocin expression in brain which is the analogue of vasopressin in nonmammalian species . If it is injected into brain of female whitecrowned sparrows they sing. The gonadal steroid hormones induce vasotocin gene expression in brain during early periods of development and are later activated for song production. One role of steroid hormone is to sustain production of a number of neuropeptides. Vasopressin fibres and cell bodies in medial nucleus and amygdale are fully depleted when testosterone is eliminated and then restored in several species . These neuroendocrine events have functional consequences. Vasotocin mediates courtship behaviours , egg laying and sexual behaviour as well as the singing and fear (associated with amygdale) complexes . Our evolutionary past is reflected in the organization of our brain. Inappropriate behaviour reflects breakdown of neural function and in it hormones are critically involved.(brain damage,old age etc).

The hierarchical organization of brain and the simple central motive states are studied .Oestrogen acts on forebrain sites and the ventral medial region of the hypothalamus and the medial region of amygdale which activates the brainstem sites that carry out the basic programmes for lordosis. Behaviour provides one level of explanation, hormones and their actions supply another, and gene transcription furnishes a third explanation and synthesis of all these are in the context of the evolutionary theory of the brain.

When I seek to understand my behaviour , what sustains and what generated that behaviour , and what made it possible for me to generate, sustain that behaviour throughout my life , they seem to be

abstract questions of philosophy to some, but are really concrete questions for experimental scientists . And I understand it both as a philosopher and a scientist and experience the same experiences of my ancestral scientist/philosophers in both ways.

The study of endocrinology and its concepts are changing rapidly. Previously endocrinologists thought steroids could have impact only through a change in the genome , a process that takes hours to complete through mechanism of protein synthesis. Today they know that steroids can act on cell-surface structures , playing a role in membrane-related changes. On behavioural level corticosterones reduce sexual behaviour in amphibians through membrane-related changes . Both membrane-related and genomic changes are involved in synthesis of neuropeptides. Molecular biology helped the endocrinologists to link hormones to their molecular ancestors. Thyroid and corticosteroid hormones, Vitamin D, gonadal steroid hormone, prolactin, growth hormone, cytokines are members of the same molecular family and share a common ancestor and so is auxin , the plant growth hormone .

Steroid effects on neuropeptide expression and behaviour :-

STEROID HORMONE	NEURAL PEPTIDES	BEHAVIOUR
Estrogen Progesterone	Oxytocin LHRH	Female sexual behaviour
Testosterone Estrogen	Vasopressin	Flank marking, aggression, territorial defence
Testosterone	Tyrosine hydroxylase (converting enzyme) Substrate P	Male sexual behaviour
Estrogen Testosterone	Vasotocin	Sex behaviour , bird song , amphibian sexual behaviour
Estrogen Testosterone	Prolactin Oxytocin Vasopressin	Parental and attachment behaviours
Aldosterone Corticosterone	Angiotensin	Water and sodium appetite
Corticosterone	Corticotrophin-releasing hormone	Water and sodium appetite

		Fear, anxiety, depression
Corticosterone	Neuropeptide Y	Food intake

#### Peptide/Neuropeptide effects on behaviour

PEPTIDE/NEUROPEPTIDES	BEHAVIOUR/STATE
Cholecystokinin	Food satiety
Oxytocin	Food satiety, sodium satiety, attachment behaviour, sexual behaviour
Insulin	Food satiety
Bombesin	Food satiety
Leptin	Food satiety
Corticotrophin-releasing hormone	Food satiety, fear
Atrial natriuretic factor	Sodium satiety
Elidoisin	Sodium satiety
Prolactin	Food intake, brooding in birds, behaviour quiescence, parental behaviour
Vasopressin	Attachment behaviour, paternal behaviour, aggression
Endorphin	Pain perception, reinforcement, sexual behaviour
Substance P	Pain perception
Melatonin	sleepiness
Cytokines	sleepiness

Gonadal sex hormones and their effects on singing and sexual behaviour was known to human race right from prehistoric times. The sexually dimorphic regions of the forebrain are also responsible for hormone-influenced behavioural responses and in a variety of species including humans, the medial preoptic nucleus is larger in males than in females. The ease with which children can achieve syntactic



and linguistic competence and express phonetic sounds is explained by Chomsky (1972. Language and mind .Harcourt brace Jovanovich) and the critical period for mastering auditory signals is between 3-7 years , and for syntax is between 8-15 years (Gleitman L and Wanner E 1982. Language acquisition .Cambridge Uty press). During the critical stages one has to get the correct visual , auditory and gustatory signals for development of neuronal structure and function. Human females exposed to high testosterone levels in the womb develop greater specializations in the cortex. Physical and behavioural characters can be influenced in utero through effect of gonadal steroid hormones is wellknown . Temperature and estradiol concentration in the critical periods of development in utero determines the sex of red-eared slider turtles. Sexual behaviour in human is less linked to concentration of gonadal steroid hormones than in rabbits or turtles. In a rooster , removal of the testis will alter its crow and physical prowess and this was proven in 19<sup>th</sup> century. (both the sound and sex power). During middle ages the young choirboys were castrated to maintain their high pitched soprano voices. In China, India and Middle east eunuchs as docile males served as entertainers of ruling class females . The auditory , hormonal, and neuronal pathways and the production of sound and sexual powers has been known from prehistoric periods and the music of the celestial Gandharva attracting the females of the earth is a story related to this knowledge. Vitamin D receptors are located in the same regions of brain that underlie sodium appetite and calcium appetite . Ultraviolet rays of the sun increase the vitamin D in our skin and thus the sun and its temperature are responsible for our calcium and sodim metabolism as well as our steroid functions , Vitamin D being the ancestor of all other steroid hormones . It acts as classic steroid on receptors and on ligand transcription factors. The mammalian brain is feminine unless it is converted to a masculine form by testosterone. Therefore all of us begin life as a female . The masculinisation or defeminisation of brain results in masculine behaviour , aggression, play, ingestion, key physiological processes etc. Conversion of estradiol to testosterone is by enzymatic process called aromatization . This change should take place during certain critical periods of development . Three critically sexually dimorphic forebrain nuclei are preoptic nuclei, medial bed nuclei of stria terminalis and medial amygdale. When these are deprived of testosterone , sexual behaviour decline, as do neurotransmitters and neuropeptides. Within medial preoptic nuclei males have more cholecystokinin producing cells than females. Vasopressin is synthesized in the bed nucleus of the stria terminalis.

The role of the five senses ( *gandha,sparsa,roopa,rasa* and *sruthy*) and its attachments to external world of names and forms , sounds and meanings etc has been well studied by Indian scientists and the mind as the controlling factor of the five sense organs and the five organs of action (*karmendriya*) having sensori-motor functions recognized .The role of the *samsaara* (world of reproduction, and existence of races) and of knowledge or cognition of it by experience was explored in detail . Lordosis , the female receptivity to sex is triggered by estrogen and progesterone and centrally delivered by oxytocin and a combination of these hormones triggers the potential for lordosis .Why the male koils sings beautifully? Why the male peacock dances beautifully? The male behaviour is to trigger the lordosis of the female . Castrated males do not show that behaviour. Decerebrated females are not showing lordosis either. Although basic reflexes of sexual responses are mediated by brainstem , forebrain sites initiate expression of motivated behaviour for sexual contact. Hypothalamic-pituitary-gonadal axis regulates the sexual behaviour . Brain supervises these activities by logical analysis and problemsolving abilities . It is interesting to note that the lordosis behaviour and the maternal behaviour are induced by oxytocin

receptors in the same region of the brain . The same receptor responds to estrogen and progesterone stimulus and produce the sexual love and maternal love. And the same receptors are responsible for the singing abilities also. Estrogen regulates a number of genes for brain peptide including prolactin and tachykinin. A number of neuropeptides or neurotransmitters influence sexual behaviour. They include endorphins, gonadotrophin-releasing hormone, LHRH, substance P, Cholecystokinin, dopamine , Estrogen induce proteins in the brain like Gamma aminobutyric acid (GABA), n-methyl D aspartate(NMDA) receptors which are both inhibitory and excitatory. Structural changes in these proteins may not necessarily depend upon genomic changes.

## TESTOSTERONE

Beach F.A (1948.Hormones and behavior New york : Hoeber) proved that testosterone influence the central motive state in males to search for females and then to try to mount them under suitable conditions. Both appetitive and consummatory behaviour are affected by testosterone . The consummatory phase of male sexual behaviour includes pelvic thrusting, mounting, gripping (embracing) and ejaculation. The male knows the female in estrus and not in estrus. The vomeronasal organ (relaying olfactory information of *gandha* or smell) activates several sexually dimorphic brain sites that responds to females in estrus (Wood and Newman 1995 . Integration of chemosensory and hormonal cues is essential for mating in the male syrian hamster .(J of Neurosciences 11.7261-9) and thus the behaviour of the singing *Gandharva* who smells the *gandha* of a female in estrus is scientifically proven by animal studies. Organisational effects of testosterone on brainstem and spinal cord sites is essential for penile erection. Testosterone alters dendrites in motor neurons that act directly on target muscles for penile erection. The forebrain orchestrates the male sexual behaviour. Autoradiographic studies and in situ Hybridization studies showed androgen binding sites in sexually dimorphic brain structures like medial preoptic area. This area is particularly important for male sexual behaviour and for control of this area the yogins meditate . (The *veeryadhaarana* of the yogin concentrating in between the two eyes in *Agnaachakra*) .In fact by concentration here the prowess is increased but is wellcontrolled . Aromatase inhibition aborts the activation of male sexual motivation . Amygdala lesions reduce motivation to gain access to females and preoptic area lesions reduce both motivation as well as sexual performance in the presence of females.(Everitt and Stacey 1987.Studies of instrumental behaviour with sexual reinforcement in male rats .Effect of preoptic area lesions ,castration and testosterone.J Comp.Psychol .101:407-19) When androgens are elevated the sexually dimorphic nuclei are activated as shown by c-fos studies (anatomic markers)..Testosterone facilitates substance P expression in brain as well as other neurotransmitters. Tyrosine hydroxylase (TH) neurons are elevated in medial amygdala while mating when testosterone is elevated. Both substance P and TH neurons are linked to male sexual behaviour.

*Gandham* or *Sourabhya* in Sanskrit is the sense of good smell (fragrance) and is a property of earth . Olfaction is a primary sense of the earth essential for successful mating behaviour for mammals . Many

of the androgen and estrogen containing sites are linked to olfactory sites essential for mating (Wood et al 1993 .Brain Res 614:65-77, J Neurobiol.24:925-38). The medial nucleus of the amygdala receives olfactory input from two sources. The vomeronasal organ and the olfactory tract and its interaction with androgen sites. The olfactory tract is also the tract of our prana (breath) and therefore our voice. Therefore, to control the amygdala (fears) and pathways from amygdala to other sexually dimorphic sites (amygdala-fugal pathways) which interact with olfactory cues in driving the central states , pranaayaama is done by the yogin. Thus *gandha*, *prana*, sound production and music and the phenomenon of control of senses and control of desires was known and practiced by the perfect *nadalayayogins* of yore.

### Songs in frogs, birds and association with gonadal steroids

*Xenopus laevis* is the south African clawed frog . The males of this species produce an elaborate song tied to reproduction. It is a communicative signaling in problem-solving. Female just produce a sound called a tick and is incapable of producing full song. Like bird songs the frog song has a syntax or a set of rules. This hormonally controlled behaviour of frog songs is orchestrated by androgen sites and has been mapped. Testosterone induce cell proliferation in larynx an event which later plays a role in expression of acoustic signals. Due to testosterone the male larynx is three times heavier and has 8 times more muscle fibres than the female larynx. If castrated in early development the male larynx resemble the female larynx , anatomically and behaviourally. If ovaries removed from female and testosterone injected early, the female develops a larynx similar to a male. She sings like an adult male frog. Similar experiments were having similar results in song birds also.

The neural circuits that control the song was studied. The cranial motor nerves experience the same hormonal regulation as larynx during development. The sites in the frog brain that produce the singing behaviour in frogs include a vocal-motor-pattern generator in the tegmentum, the sensory region of the thalamus, preoptic region, and the striatum .Androgen receptors are essential for the frog song as well as the gene expression that makes it possible.

Not all birds sing. Not all humans sing, though all responds to a song. Zebra finch (*Poephila guttata*) is a beautiful singing bird and the syntax and semantics of its song compose a wellstudied piece of ethology. (Marler P,Peters S,Ball G.F,Duffy A.M jr Wingfield J.C 1988 The role of sex steroids in acquisition and production of birdsongs .Nature 336:770-2). The male birds sing melodies to attract females. The bird songs depend on two events. The activation of testosterone and perception of song during critical stages of development . Testosterone potentiates the recognition of a conspecific's song. If auditory canal is obstructed during this stage , they still sing , but it will be a muted song. Song perception is a highly specialized ability tied to communicative and territorial competence. Like human language , song production is lateralized in the brain. Left side is dominant in these behaviours. Song production , like language production, follows syntactic rules. Song resembles speech coupled to syntax and local dialectics.

The finch sings in spring when the high vocal center (HVC) nucleus enlarges as testosterone concentration increases. The song reception in the female is also located in the same region. The bird songs, the spring season (*vasantha*) and the cupid (*Kaamadeva*) are thus scientifically associated in Indian aesthetics of love and music and literature. It shows the observation power of our ancestors and their brain functioning and cognition of melody and its meaning.

Song expression induced by testosterone depends on protein synthesis. Immunohistochemistry indicates a number of neuropeptides synthesized in the circuitry underlying song production (Ball et al 1988 .J comp Neurol.265:171-80). Testosterone and the metabolic conversion of it to estradiol induce synaptogenesis for song production. Singing is initiated by estrogen and brain itself is a source of estrogen synthesis and aromatization activity that regulates songs. Neither estrogen nor testosterone alone can control bird songs. They are linked for production, expression, understanding, and communication of emotions through songs. In white-crowned sparrows vasotocin infusion into third ventricle elicited vocalization and this was particularly more in estrogen primed females. Without this treatment none of them could sing.

### Sexual dimorphism of human brain and behaviour:-

Adrenal hyperplasia in neonates makes female children prefer boy's toys. Over the years the studies on human brain have shown that corpus callosum is larger in females than in males and thus women are better able to integrate information across the cortex. The hypothalamus is different in male, female, homosexual and heterosexual men. The anterior commissure is larger in women and homosexual men than in heterosexual men. The effect of testosterone circulating during critical stage of development and the subsequent effect on neuropeptide expression in brain is the suggested reason. Women on average are better in verbal tasks and men better at spatial-mathematical reasoning. The higher the testosterone levels the poorer will be the verbal performance in men. Higher testosterone level in females increase their ability in spatial and mathematical tasks. Deductive reasoning is more with testosterone. Articulation, manual speed and dexterity perceptual speed are feminine qualities. High estrogen levels increase memory. It also improves wellbeing. Homeostasis is the key to maintaining the wellbeing of all living organisms according to Oftedal (1991. Phil.Trans.R.Soc.Lond. Biol.334:161-170). Verbal-recall and sense of well being is more in females. Estrogen induces the genes that encode brain neurotrophin factor. The effect of music and of estrogen are thus same in these qualities. So, is the performance of music more useful for a healthy balanced state or is the perception of music more useful for a balanced state is an open question. Is the singer or the listener at a relatively more healthy state? Is the male bird who desires the company of a female or the female who responds to its call at a more healthy state of mind and body? If love –maternal and erotic-is the action of estrogen on the same site as androgen and if both are needed for good communication between two partners and if estrogen gives memory and well being and sense of balance of the aggressive behaviour of male androgens and if all of us started as females and some of us became male converts by our need for racial survival, there are several reasons for us to look back and find out an integrated solution for survival. Not the survival of the aggressive over the weak, but of all the races with weak and strong characteristics alike. And that

survival is the best and can be achieved by an accommodative , peaceful, loving advaita of motherly love for entire creation. The song celestial of the eternal mother . Music therapy of India is that celestial harmony of creation and has a prehistoric past.

#### Rasa, Madhura and selection of food according to taste

Rasa or taste is something we relate to our tongue which is our organ of speech and communication. Food is the most important problemsolving activity of animals and of millions of hungry men and women of the world. Most of their time is spent on foraging for food , or in works related to food production and procurement . This is common for all living things. Hormones like cortocosterone (from adrenal) and neuropeptide Y (from neurons in brain) are increased when animals are hungry and generate the central motive state for searching and ingesting food. When the ingested meal is utilized other hormones like insulin, cholecystokinin and oxytocin are elevated. A protein called leptin also is elevated at that time. These signals the termination of a meal. These hormones influence food selection and avoidance. Food selection involves appetitive (search) and consummatory (ingestion) behaviours that reflects the central states of hunger. The hungry rat and child runs towards food. The speed reflects the degree of hunger. It also depends on the incentive of the reward . Running to a food source or water source by a hungry/thirsty animal is an example of appetitive phase of motivated behaviour. Consummatory phase is the ingestion of food. By the measurements of these two behaviours researchers study motivated behaviour. Corticosteroids and neuropeptide Y initiate appetitive ingestive behaviour and cholecystokinin, insulin and oxytocin initiate consummatory ingestive behaviour. They are two phases of the same behaviour. In a similar way , singing by a performer and enjoyment of it by the listener or Rasika is to be understood as two phases of the same behaviour. In short term and long term regulation of energy balances and homeostasis these two phases have equal importance. Since rasa is a term akin to taste and since the taste is related to our selection of food and materials and arts and sciences , and many of the neural peptides are synthesized within the gustatory neural axis which is fundamental for our selection of rasa the madhura (sweet) taste and its selection in musical repertoire is compared to that of food .

An animal which is depleted of a mineral in its diet knows by instinct that it needs that mineral. For example a phosphate deficient cow licks bones though it is not its regular food.(pp 88 Jay Schulkin). An animal which had ingested poison will not taste that food again. Dietary selection is by the experience of several thousand years and is seen in herbivorous and omnivorous animals. In 1939 Davis gave a variety of purified food to new born babies and they were allowed to choose the food themselves. The infants chose a balanced diet. (Seeing this experiment ,my cousin brother Dr Mohandas gave a variety of fruits to his baby son in 1965 and allowed him to choose what he wanted much to the distress of his mother

and grandmother). This behaviour reflects an innate preference, the mechanism of choice wired into the animal. Another way of looking at it is that the behaviour is learned or the preferences are learned from environment in which we grow. The bear is dark and mainly frugivorous in tropics while it is white and carnivorous in poles due to nonavailability of green fruits, nuts etc. The preferences are thus learned from its environment just as the skin colour which is peculiar to the tropic and poles. Probably both are operative in what we choose –our food, drinks, dress, customs and spouses and even our ways of life and music. Whether to avoid or approach a food, a discipline/art/science/person is mediated partially by hedonic (palatability) judgements. Preference and hunger are not the same. One can prefer something but may not need it. One may need something but may not prefer or like it. Food avoidance is due to disgust as noted by Darwin. The disgust response orients animals away from certain foods. Most of the vegetarians have a disgust for blood and flesh. We associate inedible objects with disgust and contaminated and rotten food are considered *Thamasic* just like flesh and meat. People avoid noxious stimuli and are attracted to sweet taste and pleasant smelling foods. The functional significance of palatability judgements ties hedonic assessments to regulation of internal milieu or homeostasis. The homeostatic needs change our palatability of a taste.

Whether food tastes salty, sweet or bitter determines our preferences. Sweetness indicates that the food is nutritious. Bitter taste is associated with danger but is needed sometimes for balancing and homeostasis. Salt is needed for water balance and all animals ingest salty and sweet food. Gustatory sensibility is phylogenetically very ancient. The anterior part of tongue is responsive to salt and sweet taste. Posterior part is responsive to bitter taste. The front part initiates the acceptance response and the back part the rejection response. The front part is innervated by the 7<sup>th</sup> cranial nerve and the back by 9<sup>th</sup> and partially by 10<sup>th</sup> cranial nerves. The 7<sup>th</sup> nerve is associated with sweet and salt (water and *madhurarasa*). The three cranial nerves mentioned are projected to the anterior part of solitary nucleus (the gustatory region of solitary nucleus). Glucagon also is related to the same area. The solitary nucleus is projected to medial parabrachial region and this mechanism is same from fish to mammals. This neural circuit subserves both specific gustatory information and more general visceral information. From parabrachial nucleus the afferents bifurcate and ascend through ventral posterior region of thalamus to insular cortex. Second route follows a ventral pathway that course through lateral hypothalamus and reach central nucleus of amygdala and the bed nucleus of stria terminalis.

This gustatory neuroanatomy shows a few interesting facts.

1. It extends to forebrain
2. It is involved in a number of motivated behaviours beyond foraging and feeding.
3. This circuit is the part of visceral neural axis of CNS and is replete with steroidal regulated neuropeptides that project from parabrachial nucleus to ventral forebrain structures namely amygdala, bed nucleus, paraventricular nucleus. The neuropeptide Y, cholecystokinin, corticotrophin-receptor hormones, enkephalin, neurotensin, and galanin are belonging to these circuit.
4. The taste-visceral neural axis contains neuropeptides linked to regulation of many motivated behaviours.

In fact taste is not controlled by the physical body , but by the brain (intellect) and the mind (the neurotransmitters causing different emotions ) and Gandhi had explicitly discovered this as the reason for the adoption of vegetarianism by the ancient Indians ,from his experiments with the vegetarian societies of England and their weekly journals. This is true of our other preferences too, including the musical ..

Insulin and sweet taste:-

Pavlov in 1927 introduced the concept of cephalic phase as anticipatory response to sweet taste . Elevated insulin is to facilitate uptake, storage and use of nutrients. This hormone is linked to cephalic phase and is prominent in foraging and feeding behaviour. Damage to ventral medial hypothalamus increase insulin secretion and damage to vagus nerve reduces it. An elevated insulin is secondary to change in central state , namely increased hunger for food. The elevated concentration of insulin reflect anticipatory utilization of glucose . Anticipatory secretion of insulin is linked to learning. How is the insulin, learning and homeostasis tied ? If rats are fed every day at the same time, they secrete insulin in anticipation of feeding. Rats fed only once per day and deprived of food for 23 hours begin to secrete insulin right before the anticipated availability of food at 24 hours. This reflects the activity of a circadian clock. They also learn to associate odours and other sensory cues not linked to a time of day, but to a food source that prompt insulin secretion. Hence for a person hungry or tasty for good music , not only the time and season but also wherever good music is available is a source of learning and fulfillment and they migrate to such sources. In the case of learning and scholarship the *Guru* is a source of good tastes and nutrition which a disciple seeks and finds out and the preferences of the disciple and his/her tastes determines or selects the guru /source and a variety of neuronal pathways are involved in this selection.

Neuropeptide Y is a 36 aminoacid peptide and have at least three different sets of receptors. It is a pancreatic polypeptide and is also produced by hypothalamic neurons including the paraventricular and the arcuate nucleus, in the central nucleus of amygdale, lateral bed nucleus of strai terminalis. These neural sites project to the brainstem sites such as dorsal vagal complex and parabrachial and solitary nuclei. Neuropeptide-Y efferents from ventrolateral medulla project to the amygdale . These sites are among the brain sites which orchestrates the central motive states. This peptide integrate feeding and other responses with regulation of hypothalamic-pituitary-adrenal axis for homeostasis and wellbeing . Neuropeptide Y elicits motivated behaviours to gain access to the desired food/goal and its sources but interestingly it does not elicit changes in intraoral intake. Both food-restricted and food deprived rats show elevation of expression of Neuropeptide Y mRNA in cell body of arcuate nucleus and other hypothalamic sites. Interaction of neuropeptide Y and CRH is fundamental in regulation of food intake.

The studies concentrate on food ingestion, water and sodium ingestion , sexual functions and behaviour, aggression, rage and fear while they fail to do research on finer emotions , on music , literature ; and

hunger and thirst for such activities and on the concept of the yogic state of *moksha*. The yogic and *samkhya* philosophy and the ancient *Raagachikitsa* of India on the other hand proceeds a step further. The *naada* which arise from the *naabhi* (the abdomen and its nerve plexus) upto the *sahasraara* (the brain) is studied as a single neuronal path with several sensory motor functional states and integrated in the *sushumna naadi* surrounded by the 720000 smaller *naadi* through which sensorimotor information constantly flow to and fro in orderly fashion. The lack of rage, aggression and anxiety and other emotions of *raaga* and *dwesha* and lack of dualities in a yogin is by perfect control of the nervous plexuses and brain structures and through it the entire sensorymotor functions of the body. The perfect internal milieu thus obtained is the homeostasis or *kaivalya* of a *naadayogin*. This perfect state is not experimented with or experienced by the modern scientists. The term psychosomatic disorders coined by modern medicine also implies a perfect psychosomatic balanced state of wellbeing which is the aim of *samkhya*, *yoga*, and of *ayurveda* as in *Naadalayayoga* or *Raagachikitsa*.

How is the *madhura* and *valsalya bhaava* in music related to parental care, attachment behaviour?

Humans seek attachment and security. Lack of it creates distress behaviours. Parents have attachment behaviour to children and children to parents during development stages facilitated by a series of hormones. The parental investment and long-term bonding in development is the security for the offspring in later life. There are two schools of thought about behaviour and endocrinology. One is that of Bernard, Canon and Richter which thinks that the body changes and hormone activation and regulation are brought about by physiological and behavioural changes. This looks at the internal milieu of animal bringing about the physiological responses and then the compensatory behavioural responses to provide stability and balance. The other school is that of Levine, Chamoux and Weiner championed by Lehrman and Friedman. According to this social events regulate the internal milieu. Suppression and elevation of reproductive hormones as functions of the environment. Some species have the ability to orchestrate social surroundings that promote secretion of hormones that lead to long term success for a species.

In a subset of children with fear, high cortisol and afraid of social contacts reach out to the mother/caregiver to reduce fear and cortisol and to facilitate social contact through them. Staying close to loving ones, feeling secure, stable and related to others is primary in this. Lack of this leads to complications throughout life. The love and social contact of children is thus important for regulating their internal milieu and hormonal concentrations. Mothers during suckling period have prolactin which makes them quiescent to sexual advances of their mates for this reason. Prolactin is needed for mammals and birds (suckling/sitting behaviour respectively) to give care and security and developing their young ones. Oxytocin is needed for regulation of milk release from nipple and behavioural response of closeness with the baby. It is a fundamental hormone during bonding period between mothers and babies. Oxytocin is a small 6 aminoacid peptide linked to attachment behaviour in general. Low concentration of oxytocin in mothers leads to lack of attachment to their babies. Central infusions



of oxytocin also induces or elicits partner preferences in females of prairie voles. Maternal aggression to enemies in mammals is also due to oxytocin. In California mouse (*Peromyscus californicus*) oxytocin is elevated also in expectant fathers.

In monogamous voles (*Microtus ochrogaster*) males care for the offsprings. In them oxytocin receptors are numerous in bed nucleus of stria terminalia unlike the mountain voles (*Microtus montanus*) which is not monogamous and does not care for its children. The greater the time they spend with the cubs the greater the number of oxytocin receptors. High oxytocin concentration increase attachment behaviour and high corticosterone levels decrease attachment behaviour. This is also true for human beings and therefore the system of monogamy and caring for the young ones has its own hormonal and behavioural advantages.

The bed nucleus is tied with attachment to young ones and the partner preference. Apart from these oxytocin is correlated to sexual arousal, pair bonding, sexual satisfaction and is involved with parturition and lactation. Always economical and opportunistic, nature uses the same hormone to control a number of different behavioural responses. The *bhaava* of love and attachment to offspring and partner is what we call *valsalya* and *madhurabhaava*. These are the *bhaava* often used in music and this naturally gives security, attachment, love, peace and feeling of wellbeing to all alike because these are the natural feelings which every one seeks and loves and desires for healthy living. The same sites of receptors of love and maternal attachment are stimulated by the *bhaava* of *madhura* and *valsalya*.

Vasopressin has effects on scentmarking and aggression. Central vasopressin is needed for pair bonding in monogamous voles. Its cellular levels of action is in medial nucleus of amygdale and medial bed nucleus of stria terminalis and is dependent on testosterone.

For the offspring lack of attachment in early periods can lead to weakening of future attachments. Lorenz described the phenomenon of imprinting. Many birds follow the first moving object they see after hatching. The first object is usually the mother and this behaviour is a logical adaptation. Attachment to objects is a foothold in the world to solve problems including food problems. Attachment causes elevation of several hormones like prolactin, growth hormones. High levels of glucocorticoids decrease prolactin and sense of attachment and security feeling. Attachment to parent is fundamental determinant of human child for survival in the world. The first orientations of the world is given by the loving parents. There is social symbiosis between child and parents. How often we feel close to parents and how we feel about that relationship determine our sense of who we are (Mahler et al 1975. The psychological birth of the human infant New York .Basic books). The lullabies and the mother's language and its rhymes and emotions and peculiarities give us a security which follows us until we die. Therefore from lullaby to deathbed-from womb to tomb- music therapy works wonders with every living being, especially the human beings.

Social attachment is simply an inverse of social separation. Neuroendocrine systems activated by separation are inhibited by social contacts. Suckling is one of the means of attachment in which several hormones are involved, both of the maternal and infantal. Sodium depletion and maternal separation

can have long term consequences when the neonate becomes an adult (Leshem ,Maroun and Del Canho 1995. Sodium depletion and maternal separation in suckling rats increases its salt intake when adult. *Phyio.Behav.*58:6-10) Maternal separation in early childhood activate the stress axis of ACTH , Corticosterone pathway, is sufficient for a lifelong increase in sodium ingestion by the adult according to Jay Schulkin(pp 131). Apart from nutrient transfer the suckling has a homeostatic symbiotic relationship between mother and child . Infants separated from mothers show decreased secretion of growth hormones , prolactin and elevated cortisol levels . They loose body weight . Stroking by mothers , the close contact of her body and her voice all have a effect of increasing growth hormone in the infant and healp its normal growth. Sense of security is essential for normal development and separation anxiety during development is an aberration that can continue to adult life. The distress experienced by brain by activation of peptides such as corticotrophinreleasing hormones is leading to vulnerability to fearfulness in later life. The parents provide a secure base which is stable for the future life of the child as an adult. Cortisol is increased in temperamentally fearful and inhibited children. They display heightened potentiated startle responses, fear of novel objects, and poor eye contact with strangers. Maternal ratings of shyness map onto behavioural inhibition and excessive shyness as well as cortisol concentrations. Vulnerability is more in toddlers separated from their mothers. Behavioural inhibition in childhood leads to anxiety disorders in adulthood and even to panic disorders. The introverted and avoidance behaviour occur as a result of this. Institutionalised children have high levels of cortisol which is reduced by contact and fostering a sense of closeness to others.

The vulnerability due to genetic make up and vulnerability due to experiences during critical stages in development , a period in which hormones can have great effects are thus recognized. We are born with more brain cells than we can use and we start losing them at birth. Neurons compete with one another forming circuits through programmes provided by their genes. Fearful and inhibited children have a more excitable circuit from the amygdale that is sustained by high cortisol concentrations and environmentally induced during critical periods of development. Perhaps the high cortisol facilitates the attention towards the aversive events and the memory of these experiences linger so that the children avoid them and that makes them inhibited and the fear-related responses are due to these .

Glucocorticoids on hippocampus and the Hypothalamic-pituitary –adrenal axis:-

Maternal stress during pregnancy increase her cortisol levels. The offspring is affected physiologically and behaviourally. This range from decreased motor performance to lower body weights , low production of growth hormone and greater fearrelated responses to unfamiliar events. The brain effects on infants of mothers having high cortisol are on the central nucleus of amygdale, lateral bed nucleus of strai terminalis and paraventricular nucleus of of hypothalamus . All these show high concentration of CRH (corticotrophin releasing hormone). After birth these stress hormones have impact on future behaviour of such infants.

Maternal separation results in activation of hypothalamic pituitary adrenal axis . Such children are likely to become listless and hopeless to several situations in later life. Altered levels of CRHreceptor activity in amygdale, prefrontal cortex, locus ceruleus and CRH activation in hypothalamus pituitary adrenal axis is demonstrated in them. In fear related freezing behavior many species secrete cortisol in excess. With

adaptation and application of broad social intelligence there are ways in which to reduce cortisol concentration and reduce fear by gaining social contact which sustains feelings of security . Social effects can modify the activation of the hypothalamic pituitary adrenal axis.

Arousal and quiescence , separation and attachment are opponent processes. Rest during the dark phase (*krishnapaksha*), diurnal cycle hormones like prolactin, melatonin and growth hormones are needed for us. These are linked to quiescence or rest. Corticosterones and CRH increase fear. Neuropeptide Y decrease fear. Prolactin is linked to alleviation of fear. Prolactin decrease fear related responses and have opposite effects of CRH. It increases or facilitates rest or quiescence and thus decrease fear. In depressed humans a drug, fluoxetine (serotonin uptake blocker) decrease cortisol and CRH concentrations and increase prolactin concentration. This reduce anxiety and promote sense of relief and quiescence.

Researchers report that while meditating prolactin concentrations increase in human beings (P.Holmes and J Schulkin pp 142 of Jay Schulkin .The neuroendocrine regulation of behaviour Cambridge university press). Davidson (Davidson J M 1976 The physiology of meditation and mystical states of consciousness Perspect.Biol.Med .19:345-79) reported changes in metabolic and humoral processes in quiet attentiveness or meditation such as elevated vasopressin , decreased cortisol levels etc which was reinforced by Jevning R, Wilson A F, VanderLaan E.F in 1978. (Jevning et al 1978 .Plasma prolactin and growth hormone during meditation .Psychosom.Med .40:329-33). Meditation (*dhyana, Samadhi*) releases prolactin which reinforce and perpetuate the relaxed peaceful state of mind forever . This is what the *Naadalayayogin* is doing and this is what the *samkhya* and *yoga* philosophy of India advocate through the *naadaanusandhaanayoga* . And this reinforced state of relaxed peaceful state of mind is proven in 1993 (Wehr T A ,Moul D E ,Barbato G,Gieson H A,Siedel J A,Barker C,Bender C 1993 Conservation of photoperiod –responsive mechanisms in humans .Am J physiol.265:846-57). This metabolic story is instructive. When the hormones of stress are elevated the hormones of reproduction and of peace and tranquility are decreased. When the hormones of reproduction, childcare and nursing increase the hormones of stress decrease..Prolactin promotes quiescence and combat stress . It protects against stress in general. When someone try to solve a mathematical problem both cortisol and prolactin are elevated at first. Prolactin is increased during defensive fighting but not in offensive fighting. This hormone promotes stillness (as in *dhyana*) and thus combat stress. It reduce gastric abnormalities and cools the mind ( psychosomatic peace). According to T A Wehr prolactin is one of the body's own tranquiliser. But abnormally high levels of this hormone also leads to unipolar depression and suicide and patient become so quiet that he/she does not move at all. In schizophrenic patients prolactin is low. For depressed patients decreasing cortisol and increasing prolactin has therapeutic effects.

A natural part of our psychobiology is the central state of fear which is not uniform, and it is controlled by hormones. Fear of unfamiliar differs from the conditioned fear and from fear due to innate releasers of fear. CRH and glucocorticoids sustain fearlike states .Fear is a property of nervous system and a product of our evolutionary history according to Jay Schulkin (pp 145). Fear is an active response. It

generates adaptive problemsolving behaviours. It is a biological phenomenon linked to perception of danger and the behavioural reaction to avoid it . The CNS prepares us to behave in certain ways, to act in certain ways . The response may be either avoid or approach the danger . Behaviours to avoid a danger , to avert it , to prevent it and to face it are expressed in appetitive and consummatory behaviours. Cortisol and stimulation of amygdala is in this way needed for survival on earth for species to cope with extreme adversities. When a negative event is anticipated human mind behaves in different ways . The fear, anxiety, agitated depression , panic disorder, posttraumatic stress disorder are extremes of the defence reactions which leads to abnormal proportions. Amygdala thus help to regulate the body's internal milieu by responding to internal signals of CRH and glucocorticoids and integrating it with external events . Animals give up the struggle for life when they feel hopelessness , or expect a sure failure. In such states the corticosterone levels are increased. Hopelessness is "learned helplessness" induced by uncontrollable shock. Uncontrollable , unpredictable aversive events leads to shock. When the animal learn that their adaptive behaviour will not ameliorate the situation, the animal eventually give up. They loose incentive to perform a task and become apathetic , express decreased hunger and sex drives. They loose incentive and disengage. Disengagement is an adaptive response reducing behavioral and physiological activities that would place the animal in danger or risk.

One of the most important determinants of animal learning is prediction and perceived control. Animals track events, find out the cause and effect relation between them as an important psychobiological adaptation. The ability for the discovery of cause and effect relation arise when expectations are thwarted . The discrepancy between what is expected and what actually happened induce learning and enhance attention. (Rescorla and Wagner 1972 .Classical conditioning Vol 2 current research and theory ed A Black and W Prokasy pp 64-99 .New york Appleton-Century-Crofts). In the presence of unpredictability learning decreases and attention dissipates . Avoidance behaviour takes precedence over approach behaviour. This is what happens under extreme stress. When we are unable to predict or control a situation our glucocorticoids are elevated . When the event is predictable and controllable the levels are not raised. In fact I had a cultural shock when I first went to England , where I was totally lost and could not control or predict the next step due to the total lack of awareness of the new land. I felt an anxiety and fear which I had never experienced before . That type of temporary anxiety and fear to an unfamiliar unpredictable and unfamiliar situation is very common to all of us . And it is our hormones which give us a danger signal. This is different from high levels of cortisol in a patient with agitated depression attempting suicide in a panic disorder. They have fewer receptor binding sites for CRH in the frontal cortex.

In lizards collected into a bag, and defeated in a struggle for dominance with another male, there is elevated levels of cortisol/glucocorticoids just like human beings. The size of adrenals which secrete glucocorticoids correlate with dominance. The more dominant a male , the higher is its testosterone and lower the glucocorticoids. The converse is true for a weak animal. Skin pigmentation is associated with social status and glucocorticoid content according to Greenberg et al 1984. When exposed to females the males have less glucocorticoids and more testosterone. This is for successful reproduction and perpetuation of species. It is interesting that the subdued or less dominant (female and child) have a

high pitched soft soprano voice and the dominant has a low pitched bass voice even in animal species. Stimulation of amygdala result in activation of hypothalamic pituitary adrenal axis . Central nucleus of amygdala (CEA) plays a role in conditioned arousal as well as in attention (*sradha*) and learning and anticipatory anxiety. To abolish conditioned reflex to a fearful stimulus and to preserve the unconditioned responses , total control of this CEA is needed. The yogins achieve this with meditation and they are not depressed or hopeless , but are able to cope with any situation magnanimously and with perfect calm and ease. The music of India as part of *Naadaanusandhaanayoga* is giving this effect.

There is endogenous rhythmicity with which we adjust to periodicity in our environment , including diurnal, lunar, seasonal and tidal cycles. Humans can predict these cycles of time of earth mother ,just as we predict the cycles in a female biological body. By measuring the cycles of time, our endogenous biological clocks regulate the behaviour and physiology. One complements the other. There are several biological clocks and their anatomic location and function vary with species.

A behaviour alternate with an active phase and a passive phase. The active phase is the phase of energy use and cortisol is increased. The passive phase is energy conservation and melatonin is increased. One oscillator is synchronized with dusk and darkness and the other with dawn and light. One follows the other. Sleep is regulated by circadian mechanism and mechanisms of homeostasis. Circadian clock facilitate wakeful state (*jagrad*) and the more there is sleeplessness , the homeostatic mechanism for sleep is acted upon. Light influence pattern of hormone secretion. Constant light in a laboratory induce splitting. (dusk/dawn oscillators out of phase with one another so that behaviour and physiology also are out of phase). Light intensity plays fundamental role in inducing sleep and wakefulness. Reproductive quiescence of melatonin is more during night .The seasonal clock of tropical India being so regular , and predicatable even to a casual observer made it possible for us to make our Raga cycles accordingly .

Predictive versus Reactive homeostasis:-

Predictive homeostasis is anticipatory and predicts when events will occur in environment. It is important for foraging of food and food sources and survival of species. It is an evolutionary adaptation. The insects, fish, birds, mammals and human beings have circadian clocks organizing their behaviour around when objects are expected to appear. The animal uses its clock to anticipate rewards. When it is time for the mango trees to bring out blossoms , the cosmic yearly clock of the tropical India starts according to the predictive science of Indian astronomy . The cosmic and biological clocks are so adjusted that finding food in a monsoon rich land of biodiversity had been well researched by the erstwhile predictive scientists of the land. The circadian clocks play a role in facilitating predictive homeostasis by predicting not only the time of the day but also time of the season when such and such a food is available in such and such a place in the subcontinent . They could predict the bad times and store food in advance for use during the time of need. Anticipatory behaviour is always active and never passive. Insulin (for energy balance) vasopressin, angiotensin , aldosterone (for fluid balance) are

involved in predictive and reactionary homeostasis. Insulin prepares the animal for what is to come (utilization of nutrients) for what might be needed. It is predictive homeostasis. The response to an alteration in homeostatic balance and mediation in restoration of balance is the reactionary homeostasis as in water and fluid balance .

Circadian rhythm gives stability in regulation of biological systems including behaviour. They internalize the natural cycles of the external world . Ability to predict when objects (food, water, opportunities for social contacts like sex for perpetuation of races) will be seen and how they can be utilized in proper time is of great adaptive value for all races. The ancient endogenous circadian clock is present even in unicellular animals . In mammals it is dependent on hypothalamus. But even in organisms without hypothalamus it is present and this indicates that every cell is capable of circadian rhythm internalisation. Circadian rhythm is the part of cognitive machinery that allow animals to measure time and do problem solving. As a measurement of 24 hour day the circadian rhythm evolved in response to natural cycles of darkness and light , eventually becoming incorporated into the hardware of the brain in which the light regulates the gene expression (J.S Takahashi 1995 J Neurosci.15:6023-4) Richter found that removal of pituitary, adrenals, thyroid and pineal gland did not disrupt circadian activity in animals. But people with tumours of anterior hypothalamus have sleep disturbances . Lesions of anterior hypothalamus disrupt circadian rhythms. It was specific to suprachiasmatic nucleus (SCN) of hypothalamus . Retina receives light and project to this area. Other projections to this area are raphe nucleus in midbrain and ventral (intergeniculate leaflet) lateral geniculate nucleus. Raphe nucleus and its serotonergic pathways convey the arousal of circadian rhythmicity. The anatomic sites of the circadian clock are the SCN, paraventricular nucleus, pineal gland, retina. Changes in the light-dark cycle activate many of these brain regions. SCN is the pacemaker that is fundamental in regulation of circadian rhythms of mammals. In some birds and reptiles it is the pineal gland that is the primary circadian clock. In some birds SCN also acts as primary circadian clock.

Melatonin is secreted in anticipation to sleep and also in reaction to stress. It is involved both in anticipatory and reactive homeostasis. The secretion of it is a photoperiod-dependent phenomenon. Pineal secretion of it increased in night and depressed in daylight. The amount secreted is determined by levels of light and darkness. Temperature also influences its secretion. The number of melatonin binding sites are highest in optic area a phenomenon preserved in phylogeny.

Serotonin and melatonin are indole amines. Serotonin is transformed by a metabolic conversion to melatonin. (N acetyl 5 methoxy tryptamine). Its physiological effects are seasonal reproduction, circadian rhythms, retinal physiology and hypnotic effects. Melatonin receptors are identified in pituitary, hypothalamus, hippocampus, striatum and midbrain regions of a variety of animals. They are linked to rhythmic seasonal , diurnal changes , to light and reproduction and sleep . Melatonin increase the firing rate of neurons in rats and circadian rhythm synchronised by this . The melatonin receptor development of rat foetus and circadian pattern of secretion is linked to maternal melatonin secretion. Elevated melatonin levels decrease testosterone and estrogen levels as well as seasonal linked reproduction in long day breeders. It can decrease the reproductive response in Syrian hamsters.

Prolactin also is linked to quiescence, darkness, sleep, reproduction, and homeostatic response to stress. It is critical for both anticipatory and reactionary homeostasis. Prolactin is a pituitary hormone and its quantity is related to light intensity. In rats it is more in midday when light is maximum and is under the circadian clock. Ovariectomy and SCN lesions abolish the midday secretion of the hormone. The secretion of prolactin and melatonin vary with seasons as well as with artificial lights. When the day turns to night there is increased secretion of prolactin. Longer the night, greater the prolactin concentration. Day time naps leads to high levels of prolactin. Prolactin is influenced by photoperiods of seasons and by melatonin secretion. Prolactin is more in summer months when it plays an important function in female reproductive functions. During breastfeeding both peripheral and central prolactin is increased. This hormone influences the *Swapnanidra* or the REM sleep. Prolactin blockers will inhibit REM sleep. VIP increase prolactin secretion and REM sleep. Sleep and dreams are thus functions of VIP (vasoactive intestinal peptides), prolactin etc. The dream visions we see are due to photoinduction of c fos in the SCN and increase in hypothalamic prolactin mRNA. The actions of prolactin is not dependent on pituitary since rats without pituitary also show the same effects of REM sleep with prolactin infusions to brain. The phenomena is linked to hypothalamic and amygdala prolactin.

Cortisol is a wake up hormone which is elevated in morning hours. Corticosterone is elevated during active phase of light-dark cycle when energy utilization and glucose metabolism is highest. Food, water and salt ingestion takes place at the active phase. Corticosterone's negative feedback control over paraventricular nucleus of hypothalamus is circadian dependent. Type 1 corticosteroid receptors are under circadian control. Neuropeptide Y induced food intake is linked to circadian regulation of corticosteroid concentration, and neuropeptide Y influence circadian rhythmicity. Corticosteroids increase the neuropeptide Y concentration resulting in the search for and ingestion of food.

The 4 day estrous clock cycle in the rodents have been well studied. And in human females the estrogen progesterone cycles of 14 each constituting 28 day cycles is equivalent to the lunar cycles of waxing and waning. It is a monthly clock. Human cycle has a menstrual (bleeding) phase, a preovulatory, midluteal and premenstrual phase. The general activation of pituitary hypothalamic and adrenal axis in this is well known. 36 hours before ovulation there is surge of LH. The next phase is follicular and FSH increases. Estrogen is released into circulation. progesterone is low. To the end of this phase estrogen rise, LH secretion activated, which trigger ovulation and then both estrogen and progesterone are high stimulating menstruation. When estrogen is high women do better manual dexterity tasks and show decreased performance of spatial tasks. When both hormones are high they are better in certain motor tasks and have improved verbal abilities. Women feel physically and emotionally weak in certain phases of the monthly cycle especially in late luteal phase they are likely to get affective disorders and premenstrual syndromes are linked with affective disorders in a subset of women.

The longer the day length heavier is the brain weight and higher the DNA content in the meadow voles. Long day increases the myelination in developing meadow voles. In spring and summer gonadal steroid hormones are elevated and this determine courtships. Courtship and territorial behaviours are ultimately generated by changes in central motive states in brain. Testosterone and LH are raised in

summer and spring in ground squirrels . All mammals and some reptiles and birds also show photoperiod induced changes which affect sexual behaviour. LHRH is secreted in response to light and circadian clock which in turn influence progesterone and estrogen . Anatomic structures that mediate behaviour are altered seasonally . By inducing the central states the neuropeptide hormones changes prepare the animals for behaving in a characteristic way in different times of the year, in different seasons, in different lunar periods and in different times of a 24 hour day. Migratory behaviour of fishes, birds and human are all related to the monsoons, the oceanic cycles and available sources of food and social life and all these are incorporated in the seasonal, lunisolar, cosmic and circadian biological clocks and related behaviour. Knowing these phenomenon , the ancient classical traditions of music has different types of raaga , melody, folk songs for different times , for different occasions , for different species and classes of human beings . They are stimulants for balancing and homeostasis in relation to cosmic rhythms of nature . The classical Greek writers speak of the winter blues , as sadness or depression in winter. But in India this is a *vipralambhasringara*, an expectation of a positive union to happen ,a predictive happy reunion and thus always positive in outlook in a theme of *bhakthy* and devoted love to the separated partner . The depressed takes more sweets to get a quick fix of energy and CH intake is linked to serotonin concentrations (Wurtman 1933). Thus sweetness and *madhurabhakthy* for the separated lover are helping the depressed to get over the negative emotions of fear and anxiety and this is through light energy of the photocenters in REM sleep and imagery or creative visions of the reunion . Hormonal and calcium mechanisms regulates mood swings and balance pain and pleasure and music has that homeostatic effect linked to light and sound energy which is divine (being the subtle energy of the cosmic space). Music influencing hormonal and brain events and thus the behavioural events regulated by circadian , monthly and seasonal yearly cosmic clocks thus influence our own endogenous clocks and its expressions of balancing for a healthy positive living and such a rhythmic cyclical music related to natural rhythm is unique in the history of humanity and shows how much our ancestors were aware of the predictive and reactive homeostasis and balanced life .

We have now seen in this chapter how steroids and neuropeptides interact and influence human behaviour by their actions on brain and nervous system. The common and separate neural circuits underlying a variety of central motive states and their homeostasis also was seen. We have seen how every cell is under the circadian rhythm and how every organ is interdependent and how every hormone is interrelated to the others for a harmonious existence. How the different mineral, water , and other elements and their homeostasis depends upon the homeostasis with the cosmic clock and how this is facilitated by the mother's closeness, her loving voice and music is seen. We need a broad vision to account for the possibilities which nature affords us and also the possibilities we have with natural music of love and harmony in achieving a well balanced state of physical, mental, intellectual and spiritual health. Molecular biology has to be integrated into behavioral neurosciences of hormones, brain and behaviour and science has to be integrated with philosophy and arts . People think that this is a Utopian dream. But , as a scientist as well as an artist and philosopher I do not think so. Nature is not only a realm of constraints but a realm of immense possibilities. We need a positive outlook and we can harness our scientific and artistic powers for the betterment of the entire world . Music as a unifying principle of entire creation has great potential for establishing peace and harmony in the world and harnessing science and arts for a healthy living on our planet .



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## *Ragachikitsa* as Narrative and personalized Therapy.

### Narrative therapy:-

*Sangheetham* (music) and *saahityam* (literature/spoken or written) has a deep biological link and this is described by the wellknown simile of milk from the breast of Devi Saraswathy, the mother of all learning, in India. Now Duke university neuroscientists show evidence that a deep biological link does exist indeed between them. They have re-discovered that musical scales commonly used are that which come closest to mimicking the physics of human voice. We understand emotions expressed through music because music mimicks the way emotions are expressed in speech. Minor chord music as sad and major chord as happy has originated from this concept. Sad and happy speech also is categorized in minor and major intervals just like music. That is why we, as children love musical stories, rhymes etc. There is strong biological basis to aesthetics of sound and human prefer tones that are similar to those found in speech according to Dale Purves, prof of Neurobiology. The biological reason for appreciation of music is because it mimics speech which has been critical to our evolutionary success according to him. Then, we have to think of the evolutionary success of Indian bards and musicologists who composed every story, itihasa, purana, science and art and every knowledge in musical rhyming language and recited them for all to enjoy, appreciate and evolve as a mass culture. The term which we apply to such greatest scientific advancements of our ancestors, unfortunately, is Myth or mythology. We are actually confusing our own real nature and scientific acumen by using such unscientific terms.

Children love stories. All people irrespective of age and sex loves to narrate and to hear a story. All have a story of their life to be narrated and heard and enjoyed. All narratives and stories are used for developmental psychology of children and for healing a past wound in person-centered and family centered approaches of therapy. Who had invented the stories of panchathantra? Of the Mahabharata? Of the great epics? And how many generations have gained strength from them?

Narrative means an account or a story of an event or a person or of group of people. There is compassion in that description and knowledge too. The sensitivity of response offered to the client in a particular situation brings out the compassion as well as knowledge. People are encouraged to bring out a story of their own (which is subjective) objectively and at times to personify the problems they had experienced. This process is called the externalization and by this they are able to objectively view the problems which they considered as oppressive and face it with courage. The problem when made external, becomes not an inherent problem or innate problem and thus it loses its restricting

oppressing character . All therapies are in a way narrative therapies. (If we take case histories of doctors as narratives.) Whatever we do , or think , we understand in terms of telling and retelling them . We hear our own voice through our narration and see our own discoveries , and how a particular work or person resonated in our life and the ways in which our life contributed to our participation in the work and in the world.

In narrative therapy , the counselors find their traditional approaches sometimes challenged . All types of person-centered approaches have a common ground with narrative therapy . There is encouragement of knowledge, skill, capacity for loving and for being consciously recognized and transformative. Respect and acceptance (which was not there before ) of the conditions and of the persons self perception is reorganize,spoken freely of, reinforced, drawn, upon for positive change. Counsellor is facilitating the process . Not imposing assumed expertise of professional knowledge about the persons needs or motives. There should be co-operative egalitarian relation between two people for this to happen. Sometimes the counsellor have to follow the lead of the uninformed nonexpert client for a result-oriented approach and hence this is different from usual expert therapies and the usual counselling. The person is facilitated to engage more fully with his/her ability to reframe music experiences in music therapy with help of therapist .

One has to take into consideration all the following :-

The client approach to the health problem as well as to the musical approach to it. The first account will always be partial , selective , inconsistent, influenced by conceptual assumptions from a wider society , not from own experience alone.The therapists embedded professional assumptions and interpretative biases may make understanding remote . Also there are linguistic problems , forms of musical and spoken languages , the conventional shaping of such terms or moulding . These differences in approaches will be hindrances for a fullfledged open relationship which has to be removed by the musical life panorama sharing between two people . This part of therapy is a musical life narrative or musical biography of both therapist and of client.

Narrative therapy emerged from family therapy systems and has the same methods like extensive questioning (from a listening child) improvisations and alterations to make it more perfect and comprehensive , and with more refined perceptions and use of reflecting teams (a team approach). In fact a narrative provide a common ground where all therapeutic minds can meet (so that it is used as a part of integrated medicine). It is a place of meeting for all minds and therefore best for world peace . It can be introduced productively to all other fields of working (professions).

Can we use both subjective and objective factors together as I have done in my pilot project ? Yes . It is the best method. I will give an example .

One can describe a event (say changing of seasons ) in two ways . (rather in many ways).

One way is to speak of scientifically about atmosphere, winds, temperature changes, reasons for it, the journey of earth in its orbit around sun, the chemical changes in soil, biological aspects of plant growth, nutrition and seasonal healthy food production etc , as well as plant and animal reproduction, mating

and migratory habits for producing races and in search of seasonal foods .This is the scientific way used in Astronomy etc.

Another way is to use evocative language. The beauty of a misty autumn, the colourful spring and the plants sprouting after a refreshing rain and call of a distant cuckoo and the silence of a calm lake and the beautiful cloudless starry heavens after the rainy season .

Both are truths. If taken together in the dual perspective it gives a more complete perfect description and understanding. The two seemingly different narratives when combined make an overall richer narrative . In an actual landscape possibilities of both these as well as surprises also do occur. A variant plant out of season and out of place is possible . Like that an unexpected experience in a narrative is always a possibility. Therefore combination of subjective wellbeing and story of client and the objective evaluation by a therapist (doctor) can give a more complete picture of the entire story . A Onesided view is not entire story .

The objective history as the conventional doctors call it is a case history and not history of a person. The term itself distances it from humanity. It pathologises a human being as a case. The subjective story of the person is distancing it from the science . Musical life panorama is a bridge to fill the gap. It is both subjective as well as objective assessment of a musical experience as theragnosis (therapy as well as diagnosis). Sometimes more than one session may be needed and each session may take one hour or so for a person. Therefore in a hospital situation and a busy OP department , the help of a music therapist will go a long way as a team member to assist the team of doctors and nurses and this gives a humanitarian touch to hospitals and people who go there for treatment and job opportunities and a feeling of serving humanity for the music therapists and a assistance for doctors for keeping their clients health well and hospital stay minimal .

The story:-

There are different steps in narrating a story and improvising it .

1 Stage one is the person tells his/her story of disease which is riddled with problem-saturated descriptions since it is for the reduction of these problems that the person has approached the therapists. At this stage the role of therapist is just a listener . Listen carefully to the matter presented as well as the tones and the language used . Record everything carefully for future reference and assistance to person .

2.If the person himself/herself names the problem one can start from that point. But many people may not be able to name it by themselves. They are encouraged to find a suitable word. phrase by focusing with precision to name their problem. This will make the person feel in control of the problem itself. By naming a problem by oneself (and not by repeating what the physician had told ) one controls the problem to some extent. To give definition precisely is to externalize or try to externalize the problem . This is helpful in a narrative therapy of person-centered approach.

### 3.The third stage is using externalizing language.

The problem is having an effect on the person. It is not an intrinsic problem within the person. For example to say that I am affected by stress, anxiety, depression, cancer etc is different from saying I am stressed, depressed, anxious and cancerous. The linguistic use shows the difference. The person is encouraged to use a externalizing language and for that the therapist also should use such a language. Do not say that you are stressed but say it seems stress is having some sort of an affect on you which has to be removed. The stress is external and not internal here and can be removed .At the same time when the problem is externalized , as the psychotherapists do , do not place the abuse on something external like a person or a home condition etc so that it will permanently damage a person's view about such persons , environments etc. Musical narratives totally avoid such blaming of our family members and conditions and restrict to the innate ability of organism to adjust to any such condition , taking full control of the situation by a self healing technique.Sometimes in a narrative that a person gives we may find strong sociopolitical, gender issues , power problems in domestic or professional fields or ego problems etc. Then a decentering of the person from such issues to make therapy more acceptable is to be done .

### 4.The relative influence questions:-

Influence of music on person's life. The type of music that influenced him/her and how the pattern changed with life. How it gave feel good moments of relaxation and happiness etc . If the person had influence on music that also is to be assessed. The most important part of the musical life panorama sharing happens from here . This may take just one session or several sessions depending upon the personal acceptance and receptivity of persons who approach therapist. Sometimes totally nonreceptive people may even become drop outs from the therapy programme which is unlikely if the programme is exceptionally good.

### 5.Demonstration of a unique outcome or result in each person's experience :-

For this help to expand by asking questions , listening and providing new and suitably selected pieces of music . Focus the attention on music . Detailed focusing and description of each experience (the deconstruction) of music in this way makes a better narrative and both feelings, actions, thoughts become positive . Even the negative thoughts on past and present take a positive turn and then the balance of selfhealing brings physical changes as well which become measurable by scientific tools (of allopathy medicine). Encourage to have a richer , more complete story of life , reconsidering the identity of self and the selfhealing happen quickly .

6.Now the person is invited to take a position on the problem. Or there is a dilemma which the person faces. Should I remain dominated by the problemsaturated story of my life? Or should I take a new direction? Is it safe to do so ?

Such doubts come twice . One, when the person approaches a therapist first . And then when the first few sessions does not bring a change , especially in a less receptive person with a less efficient therapist who is less communicative.

If such doubts are voiced or externalized at the second stage by verbally expressing them directly to therapist the two will find out a solution and win together. The therapist can then assist to decide by oneself. The possible outcomes of different decisions or courses of action can be openly discussed, and explored together with therapist and both can win the race and enrich the discipline.

7.The use of therapeutic documents :- Documents are written evidences. The person creates them and the therapists keeps them. (not like case histories which are written and kept by doctors themselves with not much role for the patient). The persons are encouraged to create them. These are the narratives which summarise the persons discoveries, describe the persons own perceived progress and the person keeps them for future reference (with a copy in the therapists office). The format may be of different kinds. The letters written by person to therapist or others, by therapist to persons, memoirs, statements, lists, essays and poems and songs created and improvised together, essays and certificates issued by the therapists. Nonverbal documents, recorded sessions, either shared or private also are documented evidences. The written word being more prominent and permanent than spoken word the documentation is for future use and growth of discipline. Authority is not of the professional expert alone as in case histories, but of all people and is thus a subaltern record. It is created and improvised by two people for entire humanity to use. (The client's letters as records).

The MelakarthaRaaga scheme created and improvised and recorded and re-recorded several times by Bhuvaneswari and Me and used for therapy purposes is another therapeutic document of this kind which we developed for a focused specific purpose..

These are apart from the statistical results of physical measurements and anxiety scores which were done according to the usual routine protocols of Allopathy medical research.

8.Re-membering:- The comfort and support a person derives from memories of a cherished or loved person or an experience is maximum made use of in Musical life panorama. The person always remembers people who made the most important and cherished moments or the most important musical contribution in their lives. Sometimes it may be a direct contribution or may be an indirect contribution from famous people for developing courage, self-help, integrity, patriotism or life style etc too. Invited by a therapist a person recollects all such events in ones life and includes all of them in the narrative and thus all such people who made important contributions to the person become the members of his/her Life-club. People also exclude the negative influences or the abusive, sarcastic persons from the narratives so that no illwill is created in anyone.

The narrative thus becomes a most positive outcome of the person who wants to convey a positive message of life to all.

9.Using outsiders as witnesses:-

After sometime , the person can provide a sharing platform with others so that the experience of the person becomes known to all for benefit of society. Telling, re-telling of the story gives the message very clear forms. And audience with similar experiences giving their support will be enriching the persons experience as well as that of the society .The videotaped sessions of this kind will be of use for further use for enriching the discipline.

#### 10.Continuing therapy:-

Telling and re-telling and enriching ones life experiences and self healing can continue forever till the person survives. But once the person is able to selfheal and take charge of the musical repertoire oneself , the session with therapist can be ended. If needed the session can continue (if the person so desires) at a later stage .

11.Ending therapy:- When the person decides that the self story is rich enough to sustain her/his future the session ends. Occasional recreation of such joyful interactions can be done in which all participates and share experiences.

Mahabharatha is a grand narrative . A sociocultural narrative which centers around ethnicity of Indian races, on the past politics, social conditions, ways of trade , economy, statecraft, war and philosophy , sciences and arts and agriculture and seasons . It includes gender problems as well. This is the story of an entire saga of people. The narrative that a person makes following a music therapy session starts as a autobiography but can end up as a saga of biographies as well , as a history of the life and times of the person enriching literature. An anthology of musical life panoramas make a very good story for a good publisher.

Postmodernism started only in 1970. The modernity is linked together by stories of progressive rational scientific discoveries of nature of exterior world and the interior world of human minds (Parker et al 1995 :14.Q page 22 of Martin Payne). From renaissance and industrial revolution scientists thought every mystery of the world is unraveled by human intellect and logic. Einstein, Newton, Darwin, Engels and Marx, Freud and Jung were taken for granted and their science became just beliefs in the generations after them. The belief in their words assumed the status of dominant truths in modernism. For example every person thinks that childhood experiences alone can light up the entire personality of a human being , including all his/her actions, thoughts etc .That is not truth , but just a belief after Freud.

The modernist dominant truths like ,

- 1 Cause and effects are universal and knowable.
- 2.Humans can understand truth/reality as objective observers
- 3.Language refers to and reflects reality

4. History of growth of knowledge consists of exceptional persons applying their skills, and humanity appears to have limitless potential for uncovering the actual nature of physical and biological reality.

5. Modern knowledge is deep and is out of reach of common people. Only experts on subject with exceptional, rare and highly developed skills can know and talk of them.

6. Just like methods for discovering truths behind physical and biological world, truths behind human motivation and social dynamics have been discovered.

7. In social sciences, distinct disciplines are based on real distinctions between various areas of human life. At the same time common human nature can be identified across cultures.

Postmodernism challenges such modernistic thinking. Science has failed to fulfill the predicted promises on betterment of human life. It has not increased productivity or reduced famines and deaths by diseases. In fact it has increased new diseases, new problems and resistant strains. The world wars, natural calamities, famine deaths, totalitarianism of regimes, local and regional separatisms, horrors of global warming and indiscriminate use of energy, selfish motives of power politics in implementing programmes of scientific nature—everything has been experienced by the world within 300 years of modern science and modernism. Strifes of civil and global types show that science can be used for major killings and wiping out of entire races.

The problem is that we have to distinguish scientific methods and research methods from the practical implementation of results of such investigations. The research methods of science are good. It is at implementation level they are lethal. Those who do research are scientists and those who implement it are usually not scientists is the simple reason. So, in a postmodern way of using subaltern methods for therapy and narratives one can take the scientific methods for documentation. But we have to question the modernistic belief in science as such.

We have to ask and reexamine, think through logic, take apart each concept and check out and re-assemble in a new way. This process is called deconstruction. It is a detailed scrutinizing, nothing is taken for granted including modern science, and the experiences of persons is the touchstone /the subaltern is as important as mainstream history. The alternative medical knowledge system is as important—probably more suited to the regional health problems of each race. Post-modernism is not anti-modern or conservative simply by the fact that it does not take modern science for granted. It is not taking the conservative belief also for granted. But is taking the best points from both streams so that a new re-construction is done after de-construction of the old.



Ayurveda and its principles of ecological balance, the use of sound and raaga and swara for balancing health , and the allopathic research methods for proof of it are thus combined or integrated for benefit of all concerned in music therapy .

Thus narrative as a local knowledge of a person (subaltern knowledge) becomes as important and objective as the knowledge of an expert . Local knowledge when expressed as a dialogue between two people (as in Old medical texts of India) or as a biography of life panorama , or as a problem outlined in solving in a therapy context, the outcome of such a problem solving all become documents for future use.

Narrative is a scheme by means of which human beings give meaning to their experience of temporality and personal actions. It gives purpose to life and allow us to join every day actions and events into episodic units . It is a framework for understanding the past events of persons life as well as that of the society of which the person is a part, and for planning of a better future for person and society. It is the primary scheme by which human existence is rendered meaningful according to Polkinghorne (1988:11).

The post-structuralist therapy:-

We live on earth which has a four-dimensional spacetime. We are also having a fourdimensional solid existence . What sign is seen on the surface of earth is an indicator of its internal state. Just like an external sign on body is a sign of an internal problem . If there is a malfunction on surface , there is need to look deep under the surface . But this Structuralist metaphor of surface and deep and need of an expert to find out what is deep inside can be changed into thin and thick (rich). This terminology originated by poststructuralism is from Ryle . Ryle pointed out that a same action can have different meanings according to intentions, circumstances of the person who does the action, the external observer and his/her interpretation of that action because of preconceptions etc.

Thin description is an observer's interpretation of an event which embody observer's unexamined , socially influenced preconceptions. Thick (rich) description embody the meaning of the events to persons actually involved in the event. He illustrates the point by giving example of sheep stealing by Moroccan and Jewish tribesmen which were totally misunderstood by French colonial officers who interpreted their warfare in their terms of cultural assumptions unaware of specific meaning of the incident for the tribes. (The naming of tribes as *Kallar* and cattle stealing of *Vetchipor* is similar in India ).

This means thin description is an expert's theoretical knowledge , expert diagnosis and commentaries and thick (rich ) means the actual experience of the person who suffers the condition. The power is shifted from theortical expert to the one who is directly involved with disease/problem/experience.. Thus the subjective and objective change take place. The opinion of expert is subjective due to his/her preconceived ideas and dominance due to knowledge . It originate from power centers and from power figures and power institutions . Which is objective pain ? That suffered by a person or that theorized and defined by an expert?

So subaltern , poststructural, postmodern therapy is for the less powerful , less heard, less understood, common man and his/her narratives and problems . This itself makes it a necessary tool for mass programmes and for self healing . It provides an alternative view of the entire context and integrates all into its fold for a betterment of society, for betterment of health of society , for peaceful co-existence on earth with ecological balance.

*Raagachikitsa* as a personalized approach:-

A personalized approach means a counselling for positive change.

In my home while I was a child , there was extensive practice of paddy cultivation, because my father was a farmer . The paddy that was brought from the wellwatered lowlying *kol puncha* fields were of good size grains and welldeveloped. But the same seed which had grown on the sides of the field and in the grounds where it is processed were smaller and less developed. How did this happen? Paddy in a good rainy season is welldeveloped with more production and with large size grains. And paddy grown in a drought season or when it is in a adverse circumstance like a pest infestation etc seem less developed and of smaller size. Why ?

And when I became a student of Biology in my teens I found that the organisms whether plant or animal has an inherent capacity for its own growth, maintainance and enhancement which we call development. The enviromental adversities cause dwarfing and weak constitution , but it does not destroy the innate urge within to survive even in that situation and the race survive as dwarf weak strains , to show its real nature when another season of good conditions prevail. We can trust in the wisdom of all organisms, whether small or big , in every individual . This is true of all human beings whom a therapist see too. So, it is my trust in the innate ability of all organisms to try to selfprotect and selfheal and maintain itself that lead to my personalized approach in music therapy.

The therapist is just facilitating to find this self-healing power innate in each being . To identify the discrepancy and to get over it. The innate power of human beings is best seen in infants who know what they need and what they do not need. They stop taking milk when it is enough for them. They wont eat if they are not hungry. They love to be caressed , loved and talked to in soft tones and cherish such people who give them this security of love. They reject the negative opposite type people . They love a new experience just for the sense of a new discovery and its enjoyment. Pain, unexpected loud sounds etc they reject and do not like. So we can learn from an infant , instead of teaching it the principles of music therapy.

If a person gets unconditional positive regard , he/she is in a continuous state of self maintainance and enhancement as a paddy seed in a good field, well looked after. Such persons will be able to transmit

this to next generations . The environment and the organism is a highly complex gestalt with quite a few possible permutations mutually influencing both.

Stress is something that is ubiquitous. All people have stress to some extent. But all do not fall ill. In the first stages of stress the person may not disclose it to anyone and possibly may not know it at all and therefore in the first stage we may not get a person coming for help to a therapist. But a therapist can start help in an educational institution itself to prevent stress before it starts and act as an antistress mechanism to entire society.

In the second stage the person feels there is something wrong with his/her system. Yet attributes the problem to someone else /or something else and find fault with that person/object and increase stress for both parties. (by anger and other negative emotions). At this stage also a person does not come for help since the person does not think that there is a problem with him/her but project problem on someone else (imagines) and get angry with that person and this vicious circle enhance his/her own stress and that of the surrounding people. Most of the people who come for psychological and professional stress reduction may be in this stage.

When this stage is over the third stage manifests some symptoms and signs of stress as disease and the person say that : The doctor says I have such and such a disease.

The persons coming to music therapists for a physically diagnosed disease is in this stage. The person remembers his/her past life with all its pleasures and pains . Remembers parents , their habits, how the person resembles them and how he/she is imitating or feeling the same way as them and about the present circumstances and difference from the golden age of childhood etc etc when he/she was perfectly healthy. Now the person is conscious of his/her genes and innate tendencies and how they contradict with the new surroundings he/she is in. Feelings as well as scientific analysis combine in the logistic thinking . The client wants a wellbalanced healthy life again . Wants to heal the stress and its effects. In a hospital we are seeing such persons . So hospital based music therapy practice is with such third stage onwards. And by this time the stress has become matured into a type of disease itself . (Either Cardiovascular or Gastrointestinal or any other system /multisystem involvement).The therapist has to start from any of these three stages .

The 4<sup>th</sup> stage is the change brought about by the therapy. By musical experiences and musical life panorama one has to assist the person to remember moment to moment experiences to flow continuously, uninhibitedly changing the concept of the person about the problem. In the initial stage there may be emotional outbursts with opening up of a closed door for years , but the person is now not conceptualizing a problem but simply living that experiences accepting it in a thoughtful manner. This is

done in a genuine naturalness, and person is getting acclimated to functioning . When the counselors facilitation is no more needed the person has started to trust ones own feelings and body , to accept it as it is, and transformation is complete. When such a positive change happen we call it a fully free transformed being , an Integrated process of positive change. Such a person is a fully functioning person. The stage at which the therapist see the person, the severity of the disease/stress , and the communication of the therapist and receptivity of person has roles in bringing about the total change. But , change does happen whether small or big is the positive factor. Each moment is lived to the full. And this therapy works on the high trust on the innate function of any organism whether plant , animal, man whether uni or multicellular and hence is science and art together.

What are the signs of a fully mature free functioning person?

1. Will become more creative

2. Will be less constrained in living in a freedom vs determinism conflict /debate.

Will be beyond such conflicts and all conflicts are solved by themselves.

3. Finds greater richness due to increased variety and range of experiences

4. Become more trustworthy and more constructive to society as a whole. Not living for selfish individual motives alone.

The person who is free to select what is valuable for oneself , will respect those values , love them ,enjoy experiencing them, and through that goal along with ones own growth facilitate the growth of society and of world as a whole. Any society which gives that value to all persons will find that every mature person in it prefer to uphold the same values because of this only. The mature people prefer the same value directives which made them what they are . Thus a personcentered , individuocentric growth leads to prosocial and sociocentered values. From wounds of past, to hope and healing is crucial to this change.

The intrapersonal and interpersonal relationships:-

We have to examine meanings of implicit and explicit congruence and incongruence before we proceed.

Implicit congruence is concerned with intrapersonal relation. That is an individuals awareness of ones own experience. Explicit congruence is concerned with interpersonal communication between two people ; here the therapist and the person concerned.

Incongruence may be between the concept of self and the experiences of life. Or it may be between therapist and person. Incongruence of the past experience is possible due to a past history of

conditional worth. Like you are loved only if you perform in such and such a way , if you have such and such abilities etc. Or may be due to appearance . A handsome child preferred by parents and teachers etc. Or a first rank holder child being compared to a comparatively lower rank child. Without considering the other talents of the child such comparisons might produce longlasting illeffects .

May be the child is ridiculed for obesity for several years and even when it has grown up the wounds inflicted by its parents about the beauty and possibility or lack of possibility of marriage proposals due to physical appearance , is still there. Now what the therapist has to do cautiously is to tell what is best for the health, and make positive remarks that appearance does not reduce worth of an organism /person. It is not for being worthy of acceptance by others, but for a healthy life that obesity is prevented. In this way one has to deal with every situation.

A human beings self-concept is always three-dimensional or multidimensional. One is a woman, a mother, a wife, sister, a professional, a music lover and so many other things at the same time without any contradiction. There is an organized configuration of the self .

This may be an affective configuration (like a mother lost at infancy , a teacher ridiculing for lack of intelligence etc), a traditional family style (which prevents taking opportunities by fear of safe options /unsafe or risky options etc). The regard complex one has for a elder , a famous person .a parent etc can be built up for certain values and a therapist who appreciate such values is trusted and regarded as a trusted person and thus a facilitation can happen. When persons accepts therapist as mother, sister or teacher such a thing is happening. Through the facilitator they are able to regain a lost link which had been valuable in their life.

Focusing:- This is a method to internalize or indwell experiences to clarify meaning . It is the experience of a person and hence personcentered counselling . One is allowed to have a special sense of internal awareness of body and mind complex. It is not a mere physical sense but a felt sense . The sense of a particular problem situation that any organism naturally feels. Trusting the wisdom of the organism is the principle here. How the process of focusing work ?

1.Allow to listen to a bit of music. (First start with what the individual loves most and then proceed slowly to the best suitable ones) ..Just allow whatever sense/thought that come to the mind. Need not try to analyse it or identify Raaga etc..Just sit back, enjoy and relax . In other words float into the musical sense.

This may be compared to clearing a space for cultivation of a seed.

2.Floating into music is like a meditation. We are immersed in it. And after the music try to recollect what we experienced and write down on a diary or piece of paper , whatever we felt . Do not worry about whether we are right or wrong. This is the felt sense of a musical experience.

3. After some time read it and think about it. Try to find out the quality of that felt sense (not of music) .What word, phrase or image fit in with your experience best ? Write this down beside what you have described earlier. Now we are trying to name the experience .Its quality is analysed by ourselves. We are

analyzing our own felt sense and not the music . If there are close friends who share same interest in music one can share the experience and get enriched. In the case of patients , share with the therapist and not with all people indiscriminately.

4. Suppose the word , phrase or the symbol you gave does not fit in , or if we want to change it so that it fits well, we are free to do so at any time . Sometimes the same music may bring a separate felt sense and a phrase, symbol is different with same music when you hear it several times. All these we are free to record as our personal experience. Now this is the realm of Narrative medicine. One is narrating what one felt , what one experienced and what one enjoyed most and what change it brings about to oneself . (Not what had curtailed ones progress but what enhanced ones progress). This is a positive narration. Not a negative narration of all the wounds inflicted by others/by society as the usual biographies do. This stage is called Resonance. We are resonating with our music experiences.

5. Ask:- Why do I feel so with this music? What made me feel so ? What is the effect of it on my body and mind complex? How it makes me happy , energetic and in good terms with the entire world ?

Write down the answers one gets. That makes the narration more fruitful. Both for us and for others too.

6. Receive the grace of God /*NaadaBrahman*:-

Welcome what come up within oneself. Now we are one step ahead to solve our problems ourselves. There may be need for a few more sessions with more types of music which the therapists suggest from our charts . Have continued sessions like that. We will find that we have accepted the conditions of life as it is, and we have reduced our stress by ourselves through music , and that the lack of stress has given us an immunity that withstands our disease condition better .

The necessary conditions to facilitate change:-

In 1957 Carl Rogers said that six conditions are essential for facilitating change. In 1959 he stated them as Theory of Therapy. In 2001 Wyatt amalgamated them and presented it as follows.

1. The two persons (Therapist and the person concerned) should be in psychological (not necessarily physical) contact.
2. The first person (the client) is in a state of incongruence to start with, and is vulnerable and weak and asks for guidance/help/treatment.
3. The second person (Therapist) is congruent (well integrated personality) in relationships.
4. The therapist should feel an experience of unconditional positive regard for the person /client who comes for help.

5. Therapist should have an experience of empathy, understanding of people and their internal frame of reference and endeavour to communicate this to the client.

6. The client should perceive this, at least to a minimal degree (conditions in 4 and 5) if not in full measure. The unconditional positive regard of therapist to client, and the empathic understanding if unknown to client, it is useless. If it is understood at least partially, that means the communication has been successful to some extent.

Initially conditions 3, 4 and 5 were considered as core conditions. But now the other three are also considered as core conditions.

Reasons:- A contact is a relationship. It is a profound meaningful and person-centered relation to be a psychological contact. That is a faith or trust in oneself and in the other person. So naturally the trust of the 3, 4 and 5 conditions come from it. Hence the first condition is part of core condition too.

If a person is not incongruent, the person will not come for treatment or advice for the first place. So, the incongruence and a possibility of facilitating change is existent when a client approaches a therapist. That is to reduce stress, anxiety and vulnerability is existent when the person approaches for a treatment itself. If they do not want a change, they will not come to therapist at all.

The client should experience that the therapist has the qualities which he/she had heard about and talked about. So communication of therapist's mind to the client is dependent on communication skill of the therapist as well as the receptivity of the person who approached. For that contact communication (contact) either spoken or written is essential. (the first condition). So the conditions 1, 2 and 6 are as important as 3, 4 and 5.

Congruence is a mental state that one achieves alone, within oneself. It exists with oneself and with one's situations as in the case of a paddy seed. So, the client is aware of what is happening within him/herself but not what is within the therapist. So, how can a client know that I am approaching a person who is congruent with him/herself? It is impossible or near impossible. But he/she can perceive the empathy and unconditional positive regard for all life forms/all organisms in a therapist. So what Carl Rogers meant by congruence here is the relationship of the two people (not the congruence of the self attained alone in meditation only) the therapist and client for a healing experience. If a therapist has a unconditional positive regard for all organisms (and hence the client) the client experiences the unconditional positive self-regard and thus self-healing starts its cycle. Thus the good therapist is like a good farmer giving a good environment for a paddy seed to show up its best potential. This is the philosophy of therapeutic human interaction in *Raagachikitsa* or Music therapy. Genuineness and empathic understanding are only two contextual attributes of unconditional positive regard.

Trust is tenderness and love and that bridges two hearts. Quality of tenderness as demonstrating a preparedness and an ability to move between worlds of the physical, emotional, cognitive and mystical planes without any strain (as a good musician do in concert) has to be understood.

The stream of love, effortless, with intuitive understanding of nature and its laws is communicated even without any biographical data by the therapist and the client instinctively recognizes in him/her the beloved companion in the same journey. Thus the "Presence" of the second person in first person's life is a profound acceptance of presence in one's life journey. It is a spiritual relationship and spiritual understanding rather than physical alone. Music and musical life panorama and music therapy experiences give a profound spiritual experience. The method is planned. But the experience is not planned. It comes when we least expect it. When we least predict it to happen. Both therapist and client get such experiences in the sojourn. It transcends all past experiences and a profound growth and selfhealing happen. The effects of this healing is but measurable with common parameters (physical) of modern medicine.

Thus the personalized approach of music therapy is transcending all planes of existence from physical, mental, intellectual to spiritual in creative and scientific ways. It does not have any side effects if proper conditions are applied judiciously and can be applied in mass scale in hospitals, educational and professional institutions as well as in family/day care homes.

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#### Chapter 6

### Social psychology in therapy



In contemporary industrialized societies , psychological aspects of health and illness are readily acknowledged and there is widespread acceptance of the idea that mental and physical health are intimately related. A century ago , medical doctors tended to view health as the absence of disease and to regard illness as a physiological matter. The idea that every individual act to improve their own health by a lifestyle and a psychological means was overlooked by the medical professionals . They thought that the only way to keep healthy is by the science they offer to a diseased person (patient) to get back the lost health. In stark contrast to this earlier approach , health is now typically defined in terms of biological, psychological, and social aspects of wellbeing . This biopsychosocial model of health is consistent with contemporary thought which recognize the importance of social psychological factors in every aspect of health and illness. A variety of factors have had an influence on the development of this new perspective. The twentyfirst century saw a increased lifespan along with increase in dementia and Alzheimers and other geriatric problems as well as lung cancer , and other types of malignancies related to certain lifestyles. Both categories are amenable to psychological research . And psychological approaches have been applied in these areas. Psychological and social elements to definitions of health including the geographical features and social capital broadened research and integrative medical approaches came in , displacing the autonomy of a single type of Medical knowledge (that is the modern Medicine ) alone .Health psychology continues to examine factors such as gender, ethnicity and life style, socioeconomic status in relation to health. Particular emphasis is placed on stress in causing diseases. Stress is a factor in the development and experience of illness within the emerging field of psychoneuroimmunology . The growing cost of modern medical treatment which is sophisticated and costly but does not give a cost-effective cure for the disorders also has changed the old equations in favour of integrated medical practice. For any type of health sciences , whether modern or ancient , it would be cost-effective to prevent illness, rather than treat illness. With this in mind, health promotion has made extensive social psychological research . Application of social psychology to health does not merely address a specific problem. It has lead to development of models and theories for better understanding of health and illness in a sociocultural context. This also lead to rejection of Psychology's traditional emphasis on dysfunction alone, and instead of that investigation of factors which promote the "Good life" for a welfare state is emphasized ,as exemplified in the positive psychology movement . (Page 64.Applying social psychology John Cramer,Noel Sheehy,JaquellineReilly,Kren Trew ,and Orla Muldoon. Palgrave Macmillan 2003). Following this the old Biomedical Model of disease has changed to the new Biopsychosocial Model.

In this model , the medical research discovered links between some disorders and certain habits and lifestyles. (Example: eating animal fats , smoking etc for cancer; stress for Coronary artery disease and many others). Eliminating such behaviours often can prevent disease to some extent, or if already a person is ill, prevent its complications.

To prevent disease the people needs social cognition of how to achieve it. That is social as well as cognitive factors exert influence on health and illness of a person. The perceptions, attitudes, decision-making and other cognitive processes in a person determines his health-related behaviour. Two theories of social psychology on social cognition first formulated were Theory of reasoned action (TRA) and

Theory of Planned behavior (TPB). Even if there is cognition , an individual may not be able to practice what he /she wants if the social capital is not there.

In order to interpret symptoms as a sign of a particular disease the individual need knowledge about it . That is a part of education department. The social conditions of poverty, malnutrition, and environmental pollution etc cannot be controlled by a individual alone . The agroecology and food sufficiency, clean drinking water, disposal of waste and pure environment etc are goals of a society which wants its citizens to be healthy and to prevent communicable diseases. So an integrated approach is needed in administrative set up . At present the different departments of Government function as separate islands and a combined integrated approach from both below and above (from people, and the administrators and rulers) simultaneously has to be planned for the success of an integrated scheme. This is what I wanted to achieve by drawing attention to integration of all branches of medicine with Music therapy which is basically depending on the Psychoneuroimmunology for its actions . This is said easily, but achieved with great difficulty and slowly in a Government machinery which is highly hierarchical and Beauraucratic. By getting co-operation of people –from panchayaths, from grassroot levels, from musicians, doctors , and from public and media –from below this is made somewhat easier . For this one has to make a series of lectures and write articles, books on the subject so that the communication percolates to all alike. For me, the first several years of my music Therapy work had gone into this preliminary steps .

Wilkinson R.G (1996.Unhealthy societies. The afflictions of inequality. Page 1.Routledge) stated that “Medical science can address the biological pathways involved in disease , the Pathology and the opportunities for treatment , but to the extent that health is a social product and some forms of social organizations are healthier than others , advances in our understanding of health will depend on social research.

#### Practical issues:

In medical science the gold standard for research is a empirical evidence from an RCT .(Randomised controlled study which is ideally doubleblind , placebo controlled trial). Pre and post testing is compared and statistically significant differences between the groups attributed to the treatment. This works well in a biomedical format of disease. From a biopsychosocial model to achieve the necessary degree of control is difficult. The variables has to be selected carefully . How I eliminated bias and how I controlled my variables in Music , I have already discussed in my previous work .

The pilot study intended at the reduction of the modifiable factors of heart disease , (stress, anxiety and blood pressure ) with vocal music using Indian Raagaas. Then , to this project the Yoga, Ayurveda, and Chakra related theories of different indigenous medical systems were integrated and analysed to get an integrated approach .

The field of health promotion utilizes models of attitude change in publicity campaigns and community health programmes. Asking people to eat less, but nutritious food, take up regular exercise, reduce alcohol intake, stop smoking has some impact but is limited only according to Bennet and Murphy . But when it comes to using music for prevention of disease , and for personality development and improved memory and cognition in children there is more positive response because everyone has a positive experience of peace with music and has previous experience of its feel good nature , even without hearing about music therapy . This universal appeal for music makes it an ideal tool for integration of medicine and for social health promotion .

The TV exposure for too long is harmful because it suggests that audiences are passive and uncritical and , soaking up whatever is exposed to induce a pernicious change in values, attitudes and behaviour. This is true of music too. A person loves one particular type of music need not be because it is good for him/her but he/she had been exposed to it too long. This problem was the first I had to tackle when all my clients chose Yesudas voice . This objection is likely to occur from the medical personnel and research workers. Therefore I wanted to have a control voice which is soft and good for therapy , which can sing classical music well, and at the same time unfamiliar to the clients and a female voice (quite unlike Yesudas). If I get good response from the same people who love Yesudas voice, then I have proof that

- 1.It is not familiarity but quality of voice and the raaga that is doing the healing
- 2.Both the test voice and the control voice being good and soft , both were acting as control to each other.
- 3.The voices were tested on 30 volunteers in controlled and uncontrolled atmosphere
- 4.The voices were tested on clients with a variety of illnesses
- 5.The voices were tested even in a big crowd where the people were at random , uncontrolled in parameters
- 6.In all cases , written feedback as psychosocial research procedure was collected
- 7.The selected cases were interviewed for more detailed analysis so that narrative medicine also was included
- 8.The MLP of selected individuals was used for study of development of musical preferences and cognition of music .

In this way equal importance was given to discipline of music .(Not only to medical science ).

Since music therapy is a communication there may arise three levels of problems related to communication.

- 1.Technical problems. How accurately the communication is transmitted?

2 Semantic problem. How does the transmitted symbol (language/music) convey the intended meaning?

3. Effective problems: How efficiently does the received meaning affect the behaviour (here the parameter stress and Blood pressure) in the desired way?

All these levels were taken care of with utmost care in our study . The infrastructure of Amritha Institute provided no problem regarding technical quality. Only when we went out and had an uncontrolled noisy atmosphere this technology was not available. Even then , with those limitations we could achieve good results (assessed by written feedbacks) shows the efficacy of the medium of music .

The problems that are likely to be encountered has to be thought about first and a systematic plan drawn out and executed within a timespan to get away with errors and biases. Then the research would be a success. Another important thing the Music therapists should remember is that we are part of a social team working in collaboration to facilitate health of society and it is a responsible job to be undertaken with care and maximum efficiency . Documentation is important since that alone will give you an authenticity. Just by claiming that Music is universal and healing occurs with it, the scientific community will not accept you as scientists. Or give you opportunities as scientific research assistants. You have to prove it with your projects and documented evidences and sincerity . This practical side is more important than mugging up theory and answering multiple choice and essay questions. This should be born in mind by the Music therapy training institutes and their staff as well . The universities also should take care that the projects are given more importance for student training . The initial teething troubles will be erased in due course and therefore there need not be any panicky reaction about them .

One thing is certain. Integrated medical and social sciences will be the future of our welfare state for achieving its ultimate goal of health and education and friendly unpolluted environment and in that goal Music and Music therapy has a great role to play. That is not a astrological prediction, but a prediction based on the need of the hour and the social pulse as well as the problems the medical profession faces today. All these , including a work force which will reduce unemployment of the nation are in the broad plan of this scheme . Ultimately all this planning is done for peace of all individuals, of the society , of the nation and of the entire world of living beings.

### Introjection and Projection

Introjection is a much stronger term than Internalisation that we come across social and human sciences and that usually means taking an idea or a view of the world. Introjection is by comparison more like swallowing of the world , says Ian Craib (page 40 Psychoanalysis , a critical Introduction Polity Press Blackwell.2001) like an unconscious thought (which Kleinian psychoanalysts call phantasy) . What is the use of this in practical life ? When we want to take control of an external situation we do this . That is how we hold on to what we might loose and this is how we develop an Ego as well as a superego. We

make our own worldviews and by those worldviews we try to control the world in which we live . The ego is formed by that process. But , the superego is formed by our own world view as well as the archetypal world view of all our ancestors and that makes our superego which is cultural ego , or identity as a group, a people, a nation, a race and as a people having same language, practices, rituals etc.

In daily life of a husband and wife this control by introjection is seen as adjustments . A wife buying cigarettes or alcoholic drinks to her husband or even arranging a flirting partner for him is trying to control a threatening situation and treating a situation to show that “This belongs to me and I can control it “. Actually this eases a lot of anxiety in the wife that she might loose her husband to addictions or to another woman . It shows she has tension/stress which she is trying to control by introjection. Similarly a group trying to increase numbers by conversion, by other means to increase strength has a feeling that they will fail if they do not do so. They have tension and stress and are not peaceful.

Projection is opposite to Interjection. It is putting something in our mind to another person . The brainwash of several revolutionary political parties is for this. The projection is positively seen as a part of communication also when there is projective listening or creative listening . In this we are projecting us into the mind of another person to understand what they are saying. Example when we read Gandhi, we project us into his personality and words to understand him better .

Apart from communication, sometimes projection defends our personality too. For example, when we find someone with a bad intention, we can project all our goodness onto that person, and protect ourselves from that person’s bad intentions . Because by investing that person with qualities which he/she does not actually possess , we give them an image which pleases them and makes them act accordingly to keep up that image , and thus we save ourselves. This also instills good behaviour in another person and therefore is good for both . This positive way of transforming is used by teachers and parents on children for their development. Children also project their ideals on their parents and teachers and thus by projection love them more.

Harmful examples of projection are racism, homophobia, hatred to opposite sex etc. Projection is seen in hatred of paedophiles, murderers and criminals developed by society . So there are good and bad aspects in all these. The reason for splitting the world into good and bad , liked and disliked (which is called duality) is projection and this word projection is seen in Sanskrit language of *Vedantha* as *Adhyasa* (see the commentaries on *Brahmasuthra* .*Brahmasindhu* DC Books Kottayam 2006). A split world, a split mind, a split personality is due to the splitting and projection being central to all dualities or *dwaitha*. And *Advaita* is the philosophy of nonduality, nonprojection and seeing truth as it is , absolute and blissful. This shows how our ancients were not only scientific but practical in making a society that is peaceful and self-sufficient and contended . All the divide and rule strategies of political , social and religious leaders involve duality, projection and has to be discarded by a wise person . Universal language of Music is used by the rituals of all tribes for the common and universal spirit of oneness between them and hence use of music for *Advaita* is timeless as far as humanity is concerned.

In knowledge acquisition and in communication we need projection or projective identification . But except as a method of knowledge , use of it in society as propaganda will lead to divide and rule. Therefore, use of it has to be very judicial and with proper caution . Bion made a grid which is like a coat of arms , with multiple functions . The vertical axis describe a process of working , or the activity of a natural scientist. That is a process of Observation, development of a theory from observation, a process of induction, and laws that can be tested. The vertical axis is thus a description of growth of human thought .

Row A is raw material of experience/raw data collected by senses and called by Bion as Beta elements.

Row B or Alpha elements are the primitive elements of thought from basic data of mind. These are hypothetical entities.The rows following these are real .

Row C is materials presented by patient/Client in a session , dream materials, and produced from association of alpha and beta elements

Row D are preconceptions which enable mental growth. A preconception is waiting to get some material to get attached to. When this happen we experience that as understanding the meaning of something of the patient's material. In this way the preconception becomes a conception. (Row E).

From that row , there is a purification and generalization. From conception we move to concept (Row F) which involves loosing whatever that mask truth.

The concepts are able to be arranged in more organized form , as abstract hierarchical form involving observed regularities from which hypothesis can be derived (Row G) and abstract formulae of Algebraic Calculus (Row H).

The horizontal axis deal with different uses to which thoughts can be put.

1 A tentative hypothesis about what might be going on between patient and analyst

2. The second column is relevant when analyst makes a comment to reassure him or herself that he/she knows what is going on. In groups the patience to sit and wait for what is going to emerge may be less and levels of anxiety may grow rapidly unless all members have same degree of patience to wait and watch and the same confidence in what is being done. This is a danger for all team research as I have often experienced .

3.The third column Notation, is noting something that is happening in a particular session. The group discussions on such things is good

4.4<sup>th</sup> stage is drawing the client's attention to the analyst's hypothesis. Inquiry and action columns (marked 5 and 6) and beyond upto n contain the more positive interpretations .Column 5 pursue the inquiry further, column 6 involve confronting the client with the irrefutable facts about himself/herself.

Grid of Bion 1962

	1 Definitory hypothesis	2 $\psi$	3 Notation	4 attention	5 Inquiry	6 Action	.....n
A βelement	A1	A2					
B αelement	B1	B2	B3	B4	B5	B6	...Bn
C Dream, Thought, Myths	C1	C2	C3	C4	C5	C6	...Cn
D Pre- conception	D1	D2	D3	D4	D5	D6	...Dn
E Conception	E1	E2	E3	E4	E5	E6	...En
F	F1	F2	F3	F4	F5	F6	...Fn

Concept							
G  Scientific  Deductive  system		G2					
H  Algebraic  Calculus							

The columns are actually a list of interventions rather than the psychoanalytic personification of scientific methods. The place for irrefutable facts in psychoanalysis and science are doubtful though Bion use such a term. The possibility of clarity of meaning at logical levels as we proceed is evident from the grid.

By the last process algebra and calculus we come to the conclusion all thought process is essentially an abstract process. The Symington's claim that Bion's model of thought is a fluctuation between paranoid –schizoid and depressive position. The reason they say is that the starting point is not existence but absence (Not *bhava* but *abhava* as Sankara would have said in Sanskrit).

Ian Craib ( page 102) says that absence of an organ like breast is what beta element mean. To make up for that absence thinking as a symbol but the absence is felt as a persecution, as long as one thinks about it as a lack or absence of something. Since the lack or absence is a thought of persecution, it is paranoid and a trial to transform this persecution feeling. This is in terms of absence of breast , in the case of a cancer patient.

But apply this to other types of lack or absence /*Abhava* of opportunities etc in various social, religious beliefs we will find the significance of what is going on around us .

I don't want to give examples since that might hurt people who has been believing that they are right in everything they do. But , I would be happy if they do some retrospection and find out where their political, social, philosophical and other revolutionary thoughts start and where their religions start . Lack of God or persecution from a God who sends the man from his garden, of a class which deny everything to them, of a sex that persecute opposite sex –and so on. All start from a paranoid-schizoid persecutionist view of world and then a feeble attempt to redress it. The *Advaita* on the other hand tell us that we are *Athman* and we haven't lost anything, except that a covering has occurred over our



minds which can be removed by proper thinking and education , and those who have patience and willingness can follow a regime of life and education to see that truth and enjoy supreme bliss .

In music therapy we deal with individual as well as group therapy. That is individual and group psychology is taken into consideration . A group or a mass of people , at random come for Kutcheri or music concerts. The people may be a professional group belonging to a particular institution or a particular organization and they have a group psychology .The group processes are ability to think in groups. The group discussions and the training to open up before others is thus essential for a trainee so that he/she can assess the psychology of both individuals/colleagues as well as a random or professional group. By relationships and discussions in a group we get an idea of possible doubts and objections that can arise and we get a opportunity to defend our data and our analysis which is a important point in our research and treatment . Some groups have a defence against a new discipline or a new way of teaching and evaluation . Such groups are very much against the modern methods of learning and teaching . Similarly some groups are reluctant and opposed to singing a Vivadi Raga in music and making them understand that there is no Vivadi but only balancing may be difficult but not impossible.. The philosophical and mathematical and other proofs even if we give they do not understand , since they are not receptive to abstract maths and philosophy. The only way then is to sing and demonstrate that the Vivadi can be sung with beauty and exceptional attraction and it gives a special aesthetics and healing to clients. The Melakartha Raga sung properly by a person with suswara can be used for this purpose. The group psychology is only slowly and steadily won over and do not expect to achieve it overnight. I had patiently waited more than ten years for this to happen . But it did happen is what matters. Not the time interval. One who has patience can wait not ten years but an entire lifetime to achieve and give what is truth and energy and bliss to all alike.

The Basic assumption groups have certain unconscious relationships between group members that defend against both intellectual and emotional learning. The three important features of such Basic assumption group relations are dependency, pairing and fight-flight .

Dependency:- The group members depend upon the group leader to lead them , control, organize work and take no responsibility in what is going on. This is a problem in every nation and every institution where each member/citizen has to be a responsible member in group work/team work. The leader is expected to bear all responsibilities for the work, for the mistakes and faults and when he/she asks for more responsible behaviour the subordinates quarrel with authority and become rebellious . Paradoxically the dependency group appears in a situation where it is least appropriate-in a university seminar or class. This is where everybody should engage in thinking . The working of each brain is precious for making a group successful .

When this happens what to do ? That is the best challenge for an administrative leader in a professional teaching and service institution. I had faced this in the Blood Bank of Calicut Medical college and could successfully tackle it with the Indian ethics in management in Gita and Ziel-oriented project planning . At the end of six months the entire staff of Blood Bank had been thinking with me about what to be done next and how to tackle each problem and that was a moment of real happiness for me.

Pairing:- A relationship between two members of a group that seems to relieve others of the group from responsibility of participating is called by this term by Bion. This may be between same sex or opposite sex members. The group starts to feel that this couple will rescue the entire department/group from all its problems as if they are a Messiah . Ofcourse this is only a phantasy of the group but this happens always as all of you might have experienced in your professional surroundings.

In teaching situations two teachers , or two mature and wise students /postgraduates will always dominate the discussions frequently arguing with one another and supporting each other if some one else argue with one of them. This makes all others silent witnesses of what is going on and is not a good feature for a group discussion. All should get equal opportunity to express views in a democratic set up and all should participate in discussion . Only then the group will succeed to achieve what they really should achieve.

#### Fight-Flight:-

This is a group form of defensive projection. The group will find an external enemy or an internal scapegoat for all its shortcomings and victimize that person . The criticism and attack on that enemy enable an internal cohesion and feeling of identity within the group , or if the scapegoat is within the group , among the rest of the group members. The enemy carries all the blames for failures of the group . This I need not elaborate since any person who have worked in a institution/organization might have seen or have been part of this behaviour there . Or at least you might have witnessed this several times in group politics .

Menzeis –Lyth (1989) shows how in a teaching hospital , anxieties within it being very primitive dealing with death and illness, are dealt with by a Beauraucratic organization. In organizations and in politics when there is something creating anxiety , the system is changed for something else but the anxieties are not removed. They are shifted from up to downward strata in hierarchical organizations. Whether in a matter of dependency, fight-flight or pairing in Beaurocracy to alleviate anxiety, individuals within the group inhibit their own creative thinking processes and collective work become difficult . The contrast between a well-defended , highly anxious group and a group that can mobilize individuals in a collective creative process is immense .

I will give two examples here.

1 .A client goes into deep coma in the hospital , because of negligence of the duty nurse and doctor who refused to give intravenous glucose to him , though he was having hypoglycemia on admission. The Doctor who had seen the patient earlier was on a discussion /seminar and the duty nurse insisted that without his permission she will not give glucose IV . The doctor was late after his seminar and teaching session to reach the department and by that time precious time was lost and the patient who came walking to the casualty was in deep coma. Then there had been an afterthought among the staff doctors/nurses that in case the patient die , a legal problem might come up against those who are responsible and they sent a PG trainee and collected all the case sheets , references that the patient's

wife had with her . And after that the doctor never turned up . The Principal and Superintendent came to know of such a patient in the wards and when they put up an enquiry , the Professor and Head of Department of Medicine had to take up the responsibility of the patient . For five days the patient was in coma and all investigations and questions to the family were directed to make it look like a suicide. All sorts of allegations including drug addiction, alcoholism, possibility of HIV/AIDS and even a homicide by the wife was thought of as possibilities . But the patient came back to normal state after 5 days and when he was told what had happened , he being a doctor working in the same hospital, collected the copy of the casesheet that had gone to the Record Library and asked his wife to take enough photocopies and keep. He knew his colleagues and their psychology well. They were afraid of a legal procedure against negligence and not bothered about what happens to their poor colleague. Whether he lives or not was immaterial . But they should save their skin was the only motive for actions.

2. A client with cancer needs a prolonged treatment regime and the medicines are costly The patient's parents are poor . They are struggling to make both ends meet. The drug companies are competing for market and are giving commissions to doctors for getting more markets for their product . Only with the doctor's prescription the stores give medicines and if he writes only costly ones the poor patients find it difficult to get them. The ups and downs in social status have made this problem permanent in India , at least in Kerala , where I have worked. When this is pointed out do you think the entire group of doctors, though they know this is happening will agree to it? And even those doctors who are not part of this game will not come in open to criticize their colleagues who are doing this .This sort of defence mechanisms , pairing between organizations (like doctors and drug stores and marketing people etc) exists and many are silent as pointed out in fight-flight situation. Only the dominant speak .

This social psychology of group and organizations are harmful to entire society .

Can we deal with it musically ? We can introduce humanitarianism into science and by that address such social issues is what my Music therapy project aims at. And I think my attempts are at least partly being successful .

The best Therapist is the one who understands that therapy begins where the theory ends. It is practice and constant experience that leads to theory for an expert therapist . And there is no magic formula or set of instructions /or prescriptions . Each individual being a unique person the therapist must be able to expect a new challenge in each patient . The psychotherapy is considered as a mutual search for both therapist and patient. The same is true for Music therapy practitioners too. It is a matter of enabling a person to think and feel . Not a process to know. If one feels that one knows self , then no more effort from us to know *Athman* and it will make us stagnant. We are just like babies who find our way to our mother's breast , the moment we are born. Just like that music and language make us drawn to them . That is why it is called the breast milk of mother *Saraswathy*. The patient root around in search for selfhealing , for a meaning in life, and therapist help in the search just by being there as a moral support. Because music is inherent in each individual and role of therapist is just to make the patient feel for that search of self in him/her for healing . It is not a treatment or a cure but a healing by our own

musical self . It brings about a change or transformation in the client as well as in the therapist . No body gets cured of any illness but they discover that they were not so ill, as they thought . Human psyche is full of paradoxes and in medical models of modern medicine this factor is never attended to in holistic manner. By introducing music therapy research protocols in medical curriculum we can make it more holistic and humanistic and addressing problems in a better way for benefit of the nation, of society, the discipline itself , nothing to speak of the doctor/nurse/student community and the general public as clients. A total social transformation can happen if we seriously apply this model into our social life and science. The decision whether one needs music therapy or not has to come from the client or the family members and never from the therapist .

Some one was asking me if only University educated musicians and doctors can do music therapy what about musicians who have no academic degree and yet wants to contribute their share? They can definitely contribute in thier own way .

1 Making their music the best –both with technical perfection of notes and Raaga and with careful protection of the softness of voice and having the bhavas of love, compassion and devotion in songs they are contributing their share to music therapy practice . Probably they do contribute a major share among masses making an awareness of the effects of music and contributing to the MLP of each individual in society .

2.Each Kutchery is a group therapy and so is a bhajan . By being able to do a performance like that , in front of a huge crowd , each artist is able to understand their own uniqueness, the uniqueness of their art , their own individuality and the individuality of the audience as a group. If individual therapy is that of hospitals and university educated postgraduates in a collaborative teamwork and research , the group therapy is more effective with popular singers with good knowledge of the art and a good voice and a feel for the pulse of the audience . The strength of music is best demonstrated by such individuals in the public eye .

3.They can contribute much to the society and its development and inculcation of values into society by their personality and popularity . They are the right persons to be models for the society as group therapists . Live performance of such artists in hospitals, clinics etc can be organized to help the cause . In fact the music of Yesudas which I use in my therapy sessions is the best example for that. Remember, he is not an academician of music, and nor is he a PhD holder in music. But all my music therapy programmes came out of his music and not from any academic university educated music Professor. We are dealing with health of society and individuals and the role of university educated musicians is to be participants in educative research programmes and teaching of the discipline while that of the performing artists is in betterment of their performance so that their music heals all. And role of a music lover is to spread that message for wellbeing of all. Thus we can define the functions of each person and make it our programme rather than the programme of a individual.

Each and every one , musicians,music lovers and organizers of concerts, doctors, other medical , paramedical staff and university people and educationists and public figures can contribute their share in the social reformation programmes using music because there is no one who does not love or like music of some sort

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## Chapter 7

### RESEARCH METHODS FOR MUSIC THERAPY

The objectives of this chapter is to

1.Stimulate interest in music therapy research , to inform prospective students about the importance of research in developing knowledge, and to encourage to read about further research , and carry out their own research.

2.To act as a practical handbook for researchers. As a reserve that the researcher can refer to at different times during the research process.

3.To relate elements of the research process to actual examples of music therapy research. The theory introduced can thus be related to actual practice.

The best way of understanding research is dependent upon several factors like the nature of the researched question, the skill and perseverance of the researcher, the intended outcome, the availability of resources and time and the methods employed. A good researcher should have the flexibility to adapt to such factors rather than being constrained by a particular approach or a doctrine. Research is an integral part of knowledge. Research is any honest attempt to study a problem systematically or to add something new to human knowledge. Something previously unknown is made known. It is a systematic process of discovery and advancement of human knowledge.

Just ask these questions to yourself

1. Why do I participate in music therapy?
2. What influence us in the type of our music listening , and our choice of music?
3. How important is music in our social , economic and health perspectives?

These questions are not only for the academics. But for all human beings. The answers make us all interested in music therapy . Therefore in music therapy research there is participation of both the academicians, therapists and doctors and musicians but also of the clients (listeners themselves) and it is always a participatory process of research .

#### Characteristics of research

1. It is generated by a special research question , hypothesis or a problem.
2. Follows a specific plan or a procedure which is the research process
3. Aims at increasing understanding by interpreting facts and reaching conclusions based

on facts.

4.Requires reasoned arguments to support conclusions.

5.Is reiterative , based on previous knowledge, which aims to advance , and may develop further research questions .

#### Five important stages in research

1.The stage before the data collection, where the researcher decides upon a research

question, the aims of the research, the research objectives, and theoretical framework that underline the research.

2.The designing of how to collect the data to answer the questions or the research design.

3.The actual collection of the data –by one or more research methods

4.Evaluation of the data thus collected with reference to the theoretical framework adopted.

5.Report of the research to communicate your findings to others.

#### Types of research

1.Exploratory :-When there is no prior knowledge of the phenomenon . This has to be followed up by further research that tests any ideas or hypothesis generated.

2.Descriptive. Describes a particular phenomenon focusing upon what is happening . Not the why it is happening.

3.Explanatory:-Why it happens. In this the causal relationship with variables is assessed.

4.Predictive:-Forecasts the future phenomena and trends based on interpretations suggested by the explanatory research.

Another classification of research is into pure and applied research . Pure research means to explore into a particular concept without regard for a specific problem. This is for better understanding of the overall concepts. The development of a model of coaching behaviour , or an area of intellectual enquiry is of this type. The applied research solves a specific problem . It is a solution to a practical question. A combination of both types is always ideal.

There is primary and secondary research . Primary research is collection of original data specific to the research project with questionnaires, interviews etc. Secondary research has no such data collected. It uses the existing data (secondary data) for example a census data, or data from researchers elsewhere on the same problem etc.This type of data is also used in primary research to evaluate and establish the type of data collected (primary )and its observations.And this is called literature review in primary research .



Then there is theoretical and empirical research. Theoretical research is from existing work, developing new ideas through analysis of existing theories and explorations . These new ideas not tested through collecting evidence in the form of a primary data. Empirical research supports the development of new ideas by collection of data (observation and measuring).

Some misconcepts about research

- 1.Research is not simply gathering already existing information as some people think
- 2.It is not simply collection of new data or a survey either.
- 3.It is not mere setting out to prove an opinion based on personal experience
- 4.It is not necessarily the production of something completely original , since it may use some knowledge which existed prior (literature survey) but it can lead to the production of completely original findings.
- 5.It need not always involve a problem. It can solve a problem It advances the scope of human knowledge.

The best method to learn about research is to do a small project yourself.

Objective investigation has no bearing on individual opinions. The researcher has no influence on the outcome of research or the findings . This is called a positivistic approach and the characteristics of this objective research are:-

1.Control:-The research is able to control one variable. Assess the influence of that one variable on another variable. For example , if I am using the sound of a particular singer for therapy that one particular variable and its action on individuals (healthy and unhealthy, normal and abnormal mental faculties, and on a group like a crowd in various situations , towns etc can be assessed). The size of the crowd is another variable in relation to the variable of the singer's voice and communication of emotional messages of music (As I experimented with Dr K.J.Yesudas and which any one can verify with reproducibility of results .)

2.Replication:-The same result should occur if repeated

3.Hypothesis testing:-Creation of a hypothesis which is systematically tested.

4.Precision, control and objectivity are its strengths. The cause and effect relationship is proved by statistical precision.

5.Another strength or practical reason for its acceptance is the anticipation of time schedule it allows. One can plan according to the time available , at a particular center or place where the data can be collected en masse and this is of more benefit for student research programmes.

QANTITATIVE	QUALITATIVE
1.Numerical analysis to measure social phenomena and provide facts	Nonnumerical analysis to provide understanding
2.Assume a single objective social reality.	Social reality is a subjective experience
3.Social reality is constant across different	Continuously constructed and related to

times and settings	immediate social context
4. Statistical analysis establish causal relations	Objectivity in descriptives, understanding and meaning
5. Studies samples with intention of generalizing to populations	Use smaller samples or cases
6. Objective. Researcher detached from subject under investigation.	Rich data, subjective
7. Setting often contrived	Flexible approach to data collection
8. Data collected using inanimate objects, or animals etc	Nontraditional approach for eg; content analysis. The researcher is the data collection instrument
9. Positivist approach	. Interpretative
10. Generally deductive	Inductive

Qualitative data collected, analysed, compared with transparency, consensus and clarity of quantitative data is nowadays used for marketing. It generates hidden deep or elusive information which is very useful. Qualitative research gives information about the values, beliefs, the behaviour, the consciousness and also the underlying motivation and needs of the public/clients. The views and perception of the public/clients is not simply measurement of their behaviour alone. It generates some unexpected data, have degree of flexibility, and is extremely useful to doctors, therapists, social workers and to all human beings. Thus one type of research facilitates the other and qualitative and quantitative research are both interdependent and should be simultaneously undertaken. Quantitative research is relatively simple, and is only shallow numerical data from a large sample. Qualitative research gives rich data from a smaller sample. These two approaches in science research can be summarized as follows.

## TWO BROAD RESEARCH TRADITIONS

APPROACH A	APPROACH B
Positivist	Interpretative
Quantitative	Qualitative
Deductive	Inductive
Questions such as what,when,how many	Questions such as why ,how
Predetermined design	Flexible research design continually adopted
Establish causality	Explain causality
Confirms theory	Develops new theory

It is better to have both approaches combined.

The researcher has to remember that the research process has nine major steps .

- 1 .Selection of topic
- 2.Reviewing the literature.or literature survey
- 3.Development of theoretical and conceptual frameworks
- 4.Clarification of a research question /or hypothesis. For this there should be sufficient focus on research question, the conceptual framework should have identified and defined the problem . The too many variables making the focusing difficult and making it complex has to be reduced to one or two variables and made simple and accessible. And facilities and resources should be available.
- 5.Research design
- 6.Data collection
- 7.Data analysis
- 8.Drawing conclusions
- 9.Communicating the results to the peer review and to the public (communication skills)

## SELECTION OF A RESEARCH TOPIC

It may be difficult for a student to focus on a research question directly. So first identify a broad topic on which you want to do research. There are a number of sources that will help you in doing this.

1.Existing literature. Past research projects which give a source of ideas. Unfortunately , the current availability of such projects is very rare in India and those available are not focusing on a research question. To overcome this difficulty for the research students I have created a few books which may help them to get an idea of what music therapy is and how to look for a research question in a particular field of their interest. (This book is another of that series.) Other useful Indian guidebooks are one by Dr Mamtha Sharma and another by Manorama sharma. From these sources you may encounter a certain idea, augment a theory that interests you and which you would be interested in developing further.

2.Social concerns. Contemporary social concerns and problems and how music therapy can help them will be a very good starting point for your research.

3.Popular issues. A current journal or newspaper issue can be used as a exploration point from where to start. For example the unemployment problem or the cost-effectiveness of the current healthcare practices and the lack of human element in the HRD in many institutions etc can be a starting point for you to start a music therapy research and how you can help the nation with music in such situations would be a lifelong pursuit .

4.Your personal characteristics. Your strengths and interests , your knowledge about certain subjects etc will be of influence in selecting a topic .

5. Brainstorming is a method to develop a research topic. Discuss potential ideas with others, use this interaction to develop, critique and refine your research question. The why and how is very important .

6. The research areas of the *Guru* (teacher) in music therapy will help you as well as their expertise and advise. They will be extremely happy to supervise the research you are doing since they are interested in the subject and has expertise and experience which they are willing to share. Therefore utilize their service. (But don't think that their role is to provide you with a research question. That is your responsibility. )

The originality of your research should be in using the existing knowledge in an original way, so that it increases the knowledge on the system of music therapy, even if it is not a original discovery. You can do this geographically (some theory tested in one area but not in another. You can test that in your area ) socially (focusing on social groups who have not received attention like the elderly, the physically disabled in your area ), temporally (a theory developed several years before and tested in remote past which has to be tested on contemporary society. This naturally becomes an original project) contextually (theories from outside the field of music therapy applied to music therapy ) and methodologically (collect different data to explore one phenomenon. A quantitatively tested theory applied on a qualitative test design , or collect data using in-depth interview rather than a questionnaire survey).

Now, as an example, if you look at my music therapy projects (discussed in the four books already published, given as references at the end of the work) You will find that I have applied both qualitative and quantitative (Approach A and Approach B ) programmes in it. And the existing literature on music therapy research was meager and Indian music is centuries and millennia old, and I had to devise my own methods for my research . And I had focused it on hospital based as well as socially based popular problems (elderly, development of normal and mentally compromised children, on the unemployment problems of graduates, on the cost-effective management of medical conditions , and have used both

questionnaires and interviews and statistics and a thorough literature survey (west and east) with my areas of knowledge (medicine, astronomy ,philosophy, yoga and music) and is thus an interdisciplinary approach .This is for generating research questions in the next generation who are interested in all these fields of knowledge as well as among the public and the social workers and administrators who are concerned with human welfare, national integration and world peace.

### Focussing the research question

1 Define your core concept. Students come and say , I want to do research in music therapy. In what aspect of music therapy ? They have no answer. The text books are for helping you to focus on a particular question of your interest and your knowledge . The ambiguity in the core concept will destroy the research . We have to focus on a particular topic , a drop in the vast ocean of Music therapy and then proceed.

2.What is your time frame? Are you interested in the contemporary frame or do you Just want to measure the changes and if so over what time period? Is it a lifelong interest as a career or just a timepass till you get married? Or is it genuine interest or just a passing temporary curiosity?

3.What is the geographical location? Is it one community, village , or a musician community or a single hospital/clinic ? Is there facility for comparison of two or more locations , languages, communities, hospitals /clinics etc so that it becomes a metascience?

4.What aspect of music therapy you are interested in?

5.What is your unit of analysis ( on which you are testing and the data collected and

conclusions are drawn ) Is this a voice, an instrument played by a person, a particular raaga or something else ? What is the unit of your other variable –like a particular disease, or a particular inefficiency in physical, mental, intellectual, spiritual faculty? How can you reduce the variable to one on both sides?

(If you go through the books I have written on the subject of Raagachikitsa , you will find how the focusing was done step by step and by exclusion )

Another way to focus your research question would be to

1. Write out a question like “What is the effect of such and such a raaga on such and such a disease?

2. Read about the effect you expect to achieve in a medical way, in that particular disease and also about that particular raaga . Suppose you are doing a research on Effects of Anandabhairavi on reduction of blood pressure , you have to know what is that raaga ,and how blood pressure is measured and what are the mechanisms that increase or decrease blood pressure, what is pulse pressure etc . So, also you have to know the other raagaas which has the same effect on the same condition, the fact that different raagaas can reduce blood pressure makes your question of *Anandabhairavi* alone is useful for it will be defeated. Yet, you can prove that certain *ragaas* like *aanandabhairavi* can reduce blood pressure , therefore music has an effect on blood pressure thereby contributing to the field of music therapy research in a small way.

3. Try to identify whether you can break down your key terms into more focused categories like this.

Can *Aanandabhairavi* raaga sung by anyone , or played by any instrument by any player reduce blood pressure? If not why? Can the effect be due to some other factor ? Is it



because of the singer's peculiarities (performance, pitch, *swara* usage , voice etc) or is it

because of combined effect of the singer and the accompanying instruments? Like that

you have to focus the attention on more subtle aspects. Or you can break up the *raaga* into its *swaraas* and try to find out the *swara* as cause of the reduction of blood pressure and in this , we come across the *ayurvedic* concept of *swara* as a *dravya* with *thriguna* balancing ..

4.Now you have identified a number of alternative research questions each of which you can explore separately and then set out to explain .

Your initial question of what is the effect of such and such a *raaga* on such and such a disease has changed . It has focused on the effect of sound/human voice and its emotions on reduction of sorrows/stress and thereby the blood pressure of human beings. It also focuses the music properly sung in an emotionally rich (*bhaava*) way , producing the effect , rather than on any particular *raaga* . And by concentrating on the seven *swara* as balancing factors or units of a *raaga* you reach the *sampoornaraaga* concept where all the seven *swara* are used .

Even when we have decided upon this project , it is not possible to undertake the research unless the feasibility is decided by CAFÉ acronym.(Clarke et al 1998).

1.Complexity.The topic has several competing theories or just one complex theory. We have to do justice to our research. The time and resources may be limited. The research in the chosen area is conducted within the restraints of these.

2 Access. How easy it will be for you to collect the data? How much reliability you can expect from a questionnaire?

3. Facilities and resources. Consider demands of the research. The expenses on travels, infrastructure, questionnaires with prepaid reply envelopes, specialist resources, books and cds etc. And the most important is a hospital set up/ clinic where the research is allowed to be carried out.

4. Expertise. Have you got the expertise to do a research project that necessitate the use of complex multivariate analysis? Have you got the psychological and the sociological expertise to examine group behaviour? If not, better use the expertise of the peer group, the Guru or the experienced person in the same field who is aware of all these. When you are setting the objectives for the research you can remember the SMART acronym.

1 Specific. be clear about what is to be achieved.

2. Measurable.

3. Achievable.

4. Realistic.

5. Timebound.

Write a research proposal

1. Clear statement of overall aim and associated objectives of the research

2.Statement outlining the originality , relevance and importance of research

3.Brief description of existing work in the area

4.How the research is to be conducted , the research design to be adopted, anticipated methods, and an indication of the likely sample groups.

5.How the data will be collected and analysed

6.The anticipated timescale for research

7.The anticipated outcome of research

8.Any specific requirements in terms of access , financial requirements etc.

Usual weaknesses in research proposals

1 .Research problem.

If it is of insufficient importance to society or if it is unlikely to produce any new

information or useful information to society , it is a weakness of your research . If the hypothesis upon which the research is based is unsound , or is not based on evidences then also it is a weak proposal. If the problem is more complex than the investigator realizes and has too many elements making it complex then also it is likely to be a weak proposal.

2.The weaknesses in the approach.

The proposed methods are not suitable to achieve the research objectives

The description of approach lacks specificity.

The research design has not been carefully considered.

The statistical aspects have not received sufficient attention.

### 3. Personal characteristics of researcher

The researcher does not have adequate experience or ability to undertake such a project.

The researcher is unfamiliar with the recent and important works in the field.

Therefore critically assess your research proposal before it is submitted .

## THE NEW DISCIPLINE OF MUSIC THERAPY

Discipline refers to a particular approach to the study of an aspect of a subject (here music as well as medicine as therapy) and the approaches, techniques and theories used to study and explain that particular aspect. Thus sociologists who are interested in the relationship of health, music and society have to develop their own theories on music therapy behaviour. The discipline of psychology is interested in the intrinsic influence upon music behaviour. The discipline is therefore an interdisciplinary one and requires knowledge of the basics of more than one subject.

DISCIPLINE	Field	Theory	Application	Interest groups
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Sociology	Socialization of music	Use of music as tool for group socialisation	Co-operative social welfare schemes,national integration,world peace	Sociopolitical workers,national leaders,  administrators  ,ambassadors of peace
Psychology	Music behaviour of crowds on performance	Social facilitation theory	Crowd effect to bring about the social changes	Psychologist  psychiatrist
Medicine	Effect on patients	Of music on drug dose reduction,on blood pressure etc	Individual effects in hospital/clinics	Doctors,medical researchers  Health authorities'  patients
Musicology	Effect of raaga on disease	Single raga/ assortment patient/disease	Both individual and group effects on patients/groups/disorders	Musicians  Musicologists  Music lovers  Listeners

Categories like the sociocultural climates, cultural scene , role conflicts among the public etc are labels usually put under a dustbin of intellectualism by the academic researcher of the medical field. But these come into play in any national set up where the people have a role . The Bins have come from the theory as well as experience of sociocultural situations, and the general concepts of changing such situations envisaged . Concepts and conceptual frameworks are setting these intellectual bins into named , clear terms about their interrelationships. This interrelationship and usefulness to society at large is the originality of the music therapy research as I have envisaged in my works.

And the hypothesis I put forward, is adequate to explain the relationships, between

different disciplines (including allopathy and ayurveda, yoga and music, west and eastern concepts of therapy etc) and is testable , valid and better than any other alternative hypothesis considered in this way. And it is useful to entire humanity irrespective of caste, creed or language or regionalisms.

A nation needs all its citizens and management of the human resources to the maximum is a sign of good management and leadership. There are the soft (Harward school) and Hard (Michigan school) of management of HR at present . But mine is an Indian Ethos in Management as prescribed in the *Bhagavad Geetha* and the *Shaanthiparva* of *Mahaabhaaratha* by Sage Vyasa. Most of the management systems in present day management are utilizing a policy of nine commandments as given below (Sharon 2007):-

1.Bring your emotional labour and intelligence but not your emotional needs.

2.Bring us your ideas not your objections

3.Bring us your creativity not your misbehaviour

4.Bring us your loyalty so long as we need you

5.Work to our code and procedures but remain flexible

6.Bring us your motivation though make it work-related

7.Be a team member.Though we will manage you as an individual.

8.Develop but on our terms and towards our goals

9.Listen and communicate but don't have human conflicts and we don't listen to you in the same way.

In this where is the human in human resource development? Therefore the Indian ethos

changes these nine as follows.

1.Bring us your emotional labour and intelligence to meet the emotional and intellectual needs of all of us together.

2.Bring us your ideas as well as objections as your healthy criticisms so that we improve our projects together.

3.Bring us your creativity so that we can reduce the human misbehaviour .

4.Bring us your loyalty because we need you always as cherished citizens of the nation and the world.

5.Work to the codes and procedures of research but remain flexible .

6.Bring us your motivation which is workrelated and society related .

7.Be a team member .We will all work together as team members of the nation , as world citizens at large .We are Indian citizens and members of humanity and hence we will

work as a team for the sake of humanity

8. Develop on the terms best suited to you , for a common goal of good for entire

Humanity

9. Listen and communicate . Human conflicts are natural. We will solve such conflicts and

crisis together . Based on a common goal of welfare of humanity, this is possible.

It is this Indian ethos in management that I have applied in my music therapy project. We need skills for a music therapist. Skill is some form of a competent input from all workers/citizens an institution/nation expects and incorporates knowledge , expertise, and discretion over aspects of the way work is done or job designs as well as some form of decision-making power. Music therapy project offers you the freedom of choice of selecting the area and question which you want to explore but you need to develop some expertise and competency of skills and knowledge of research procedures and its validity and reliability and acceptability before doing a project and hence this chapter is the introductory for all researchers entering this field of new research.

A musician and a rasika together makes music therapy possible and acceptable. Music therapy is always a teamwork, a co-operation between people and disciplines alike.. If there is a researcher with patience and a scientific acumen and a musician with dedication to Profession nothing is impossible.

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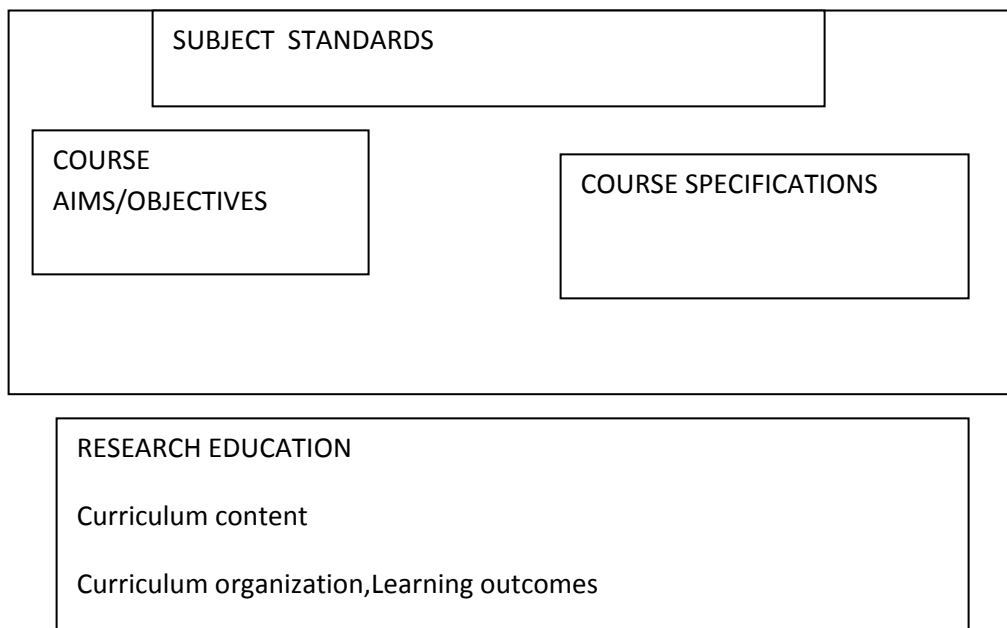
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## Chapter 8

SKILLS ,ABILITIES,ATTITUDES,QUALITIES TO BE DEVELOPED BY FACULTY



The standard expectations of the faculty (skills,capabilities,attitudes and qualities )are :-

Skills	Abilities	Attitudes	Qualities
Decision-making	Analytic thought	Proactive	Integrity
Defining	Synthetic thought	Responsive	Objectivity
Drafting,Editing	Facilitating	Ethical	Honesty
Indexing	Analysis of arguments	Positive	Leadership
Finding useful information	Reasoning (deductive,inductive)	Discrete	Self-confidence
Innovations	Evaluation	Trustworthy	Adaptability
Communications	Defining a problem	Responsible	Assertiveness
Statistics	Giving solution	Persuasive	Openness
Oral presentation	Setting criteria	Self-aware	Determination
Social awareness	Managing projects	Visionary	Finisher
Problem solving	Intuition/insight	Culturally aware	Self-discipline
Writing a report	Self-management	Reflective practitioner	Sociability
Target setting	Graphic presentation	Research orientation	Empathetic
Time management	Stress recognition	Self-development	Understanding
Use of electronic communication	Stress management	Selfcontrolled	Motivator
Writing effective text/journal article	Conflict resolution	Interdisciplinary	Experimentation
	Self-teaching		Sociological stance
	Understand issues		Self-evaluation
	Give,receive feedback		Sense of humour
	Assess consequence		Storytelling
	Application of		Narrative telling

	concepts Application of theory Model use Model construction Data management Information process Information flow Understanding these		Consistency
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Quality of life education : Human scale development and model of matrix of needs and satisfiers.:-

The needs are classified according to Axiological and Existential categories. The needs according to Existential categories are further divided as Being Having, Doing and Interacting .

Axiological	Being	Having	Doing	Interacting
Subsistence	Health Equilibrium Sense of humour adaptability	Food Shelter Job	Feed Procreate Rest work	Living environment and social setting
Protection	Care Adaptability Autonomy Equilibrium Solidarity	Insurance Savings Social security Health system Rights	Co-operate Prevent Plan Take care of Cure	Living space, Social environment, dwelling

		Family occupation	Help	
Emotional factors	Selfesteem Respect Tolerance Generosity Receptiveness Passions Determination Sensuality Sense of humour	Friendships Partnerships Relation with nature	Make love,caress, Express emotion,share, Take care of,cultivate, appreciate	Privacy, Intimacy, Home, Space of togetherness
Understanding	Critical conscience, Receptivity Curiosity, Wonder, Discipline, Intuition, Rationality	Literature Teaching Method of teaching Educational policy, Communication policy	Investigating, Study, Experiment, Educate, Analyse, Mediate	Formative interaction, Schools, University, Academics, Groups,communities Family
Participation	Adaptability Receptiveness Willingness Determination Dedication Respect	Rights Duties Privileges Work	Affiliation, Co-operation, Propose, Share, Dissent/obey, Interact,	Participative interaction in social ,national and global problem solving

	Sense of humour		Agree on, Express views.	
Intuition, Entertainment	Receptiveness Imagination Tranquility Sensuality	Games,sports, Arts Peace of mind	Daydream Dreams Recall Memory Nostalgia Fantasies Relax Fun Play	Privacy Intimacy Closeness Free time Environment Landscapes
Production/ Creation	Intuition Imagination Boldness Rationality Inventions Discovery	Skill / Ability / Methods Work	Build Invent Discover Design Compose Interpret	Feedbacks Workshops Cultural groups Audience Space for expression Temporal freedom
Identity and freedom	Sense of belonging, Selfesteem, Assertiveness, Autonomy, Determination, Openminded	Symbols Language Spirituality Habits Customs Reference groups	Commit to cause, Integrate self, Know self, Grow, Choose, Have difference from others	Social rhythms, Everyday rhythms, Maturation rhythms, Temporal/spacial

	Bold	Values	(originality),	
	Tolerance	Norms	Awareness	
		Historical memory		
		Equal rights		

The column BEING =attributes (personal and collective) as Nouns. DOING= action as verb .

HAVING = intuitions, norms, mechanisms, tools and laws expressed in one or more words INTERACTING =Locations and Milieu as time and space (internal and external).

By Music Therapy we are trying to achieve all these so that the entire Nation/Society gets an Identity through the most Universal and cultural media of Indian Music devoid of any dualities and at the same time reducing stress and facilitating peace,concentration,and research –oriented integrated approach give job opportunities to Musicians who are involved and sincere in doing their projects as a team with medical professionals .

### Putting theory into practice

Medical students and therapists learn first and foremost from what they see and experience rather than from what is written in a syllabus . If they witness respectful, collaborative interactions , if they experience listening , empathy and support , if they see difference approached with curious inquiry and dialogue rather than conflict and domination , then these interactions will frame their expectations for the nature of relationships in Medicine. But if they see powerful figures routinely entering into nonhealing, negative relationships, with one another and with their patients , if they see their mentors emphasizing the importance of expert technical knowledge above all else, especially above knowledge of self and if they experience hazing or humiliation as standard technique of medical pedagogy , then they will develop a very different template for their lifelong practice (page 120 Skills for communicating with patients .Jonathen Silverman et al Radcliff publishing 2005 )<sup>1</sup> . This sad fate is happening around in our medical practice and people concerned with valuebased education are turning to an alternative method for introducing compassion into the science of medicine through effective communication skill . And that goal is satisfied with introduction of universal language of music therapy into medical practice. Putting theory into practice is all about Music therapy in familycare. The behaviours and attributes

which facilitate family-centered care are to be cultivated . Students, doctors, nurses and music therapists are helped in developing skills in building relationships, negotiating care and facilitating parent or family-led services.

Family-centered care is a multifaceted concept evolved over the past 50 years in western Medicine but had been there in Indian Medicine from time immemorial. The social evolvement of the concept, the parental involvement and participation rather than just parental presence, the values of past societies to be incorporated into future societies ( Richman J, and Skidmore D Health implications of modern childhood Journal of childhealth care 4(3)Autumn ,pp 106-10 ;.2000).<sup>2</sup>

Family-centered care is a practice continuum. It is an all-embracing term to describe concept with different attributes. In approaches with individual as focus the family provides support to the nurse/doctor/professional who supports their child. This is parental involvement. When family is the focus, the family is client and nursing care focus on every individual of family/society. Thus needs of all is taken care of in family-centered approach. Family as unit of care or family system nursing is an approach which focus on family as a whole simultaneously . The parents are involved in their child's care but need the support of the professional at the same time. This is the partnership model (Casey A 1988 A partnership model with child and family ,senior nurse 8(4),page 8-9).<sup>3</sup> The contemporary definition of family centered care is therefore: The professional support of the child and family through a process of involvement , participation and partnership underpinned by empowerment and negotiation . The theoretical frameworks are

1 comparison of functional and holistic frameworks for family-centered care

2. communication frameworks

3. Hierarchical frameworks.

Critical components of family –centered care (Nethercott S 1993 Family-centered care ,a concept analysis .Professional Nurse ,September 794-7)<sup>4</sup> & Shelton T and smith stepanek J 1995 Pediatric nursing July /Aug 21(4)pp362-4<sup>5</sup>

Nethercott	Shelton,Stepanek
Family viewed in normal context	Values family as the constant in child's life and recognize that the supportive services will fluctuate
Role of individual family members evaluated to maximize their individual roles in provision of care	Family and professionals work in collaboration at all levels of care
Giving specific information of the child's illness to family to enable them to participate in decisionmaking	Complete and unbiased information exchanged between family and professional

Prime caregiver should be involved in care planning	Recognize and respond to cultural diversity within and between families
Family involvement in technical aspects of care should be dependent on ability and willingness to participate	Meets diverse needs of families and respects different ways of coping
Family continue with provision of childcare in hospital, providing it is not detrimental to child's condition	Promotes family-to-family support and networking
Family evaluated to determine needs for support following discharge or death	Provides flexible, accessible, comprehensive services that are responsive to diverse family needs
	Communication is the thread that weaves these interrelated elements together

LEARN model of communication :

- L      listen to families perceptions
- E      explain your perception as a professional
- A      acknowledge and discuss differences and similarities
- R      recommend treatment
- N      negotiate agreement

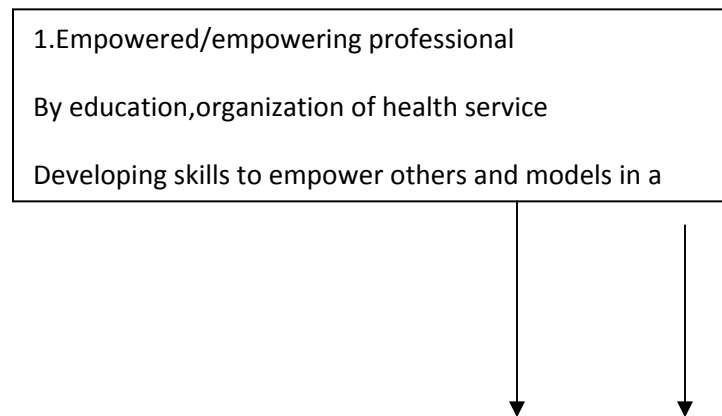
The Nursing Mutual participation model is searching by the use of open-ended questions in a caring atmosphere for what the child and family may feel is most useful for them to do . Because the professional alone cannot know what is best for the child.

The practice continuum:-

No involvement	Involvement	Participation	Partnership	Parent-led
Professional-led	Professional-led	Professional-led	Equal status	Parent-led



An empowerment model for family-centered care :-



Partnership /relationship with family continues

2. caring empathetic relationship

Activities: critical consciousness –raising, discovering reality ,connecting with reality, mutual knowing, mutual goal-setting, collaboration and partnership, learning and skill development ,increasing responsibilities, participatory experiences

3. Outcome of empowerment :

Individual Psychological (sense of mastery ,control)

Community empowerment (participatory competence )

This leads to further participatory experiences and further empowerment

Facilitating participatory experiences is the key word for teaching and for empowering individual and society . This could be for performance of a basic task . Families require help and guidance during participatory experiences to develop competencies and music therapists should be able to provide that .

#### TEACHING A PARTICIPATORY EXPERIENCE

Physical dimension	Psychological dimension	Social dimension
Basic tasks /and or techniques employed in care	Developing self-efficacy /self-esteem/self-confidence and coping skills	Decision-making /voices heard /advocacy skills

Skill teaching :-

- 1.Give full information so that they know and understand the rationale for the care and why it is necessary . The most important thing stressed first and repeated for them to remember it. Give specific precise information in a structured non-jargonised teaching session to the parents/family. Check to see whether the family has understood what you taught .
- 2.Demonstrate the skill to family
- 3.provide opportunity for them to perform the skill themselves to develop confidence and competence
- 4.Assess and give feedback to family members when they do perform the skill independently
- 5.Family members have to become competent to practice the skill independently

What are the phases in a negotiation process ?

- 1,Identify boundaries and minimize gaps between hopes of both parties.

For this the guidelines and philosophy of unit /ward shared in advance

- 2.Discovering the other's needs (ASSESS)

Use open-ended discussions- how,why,where,when,what ?

Remember to listen carefully for better assessments.

### 3.Move towards settlement(PLAN)

Empower so that one can make a decision

Identify points not acceptable , and communicate openly and honestly

Agreements have to be recorded for facilitating continuity to all involved parties to avoid danger of changes in management policies between different shifts of professionals

### 4.Achievement of agreement(Implementation).

The plan is documented by whom,and when ? What are the scopes and limitations in it ?

Summarise agreements made, ensure all understand it and implement it correctly in a teamwork.

Don't leave loose ends . Be clear about responsibility of each member . The accountability of each .

### 5.Reviewing /EVALUATE

By review and evaluation we find out the problems in practice and then address them at each step . We get chance to alter plans if it does not work out .

What negatively influence this process?

1.Assumptions that we know the objectives /needs of others.

2.Preconceptions about degree of involvement

3.Defensiveness. Trying to protect/save us from criticism/risk make us defensive to all new disciplines/changes .

Realities of practice which are spoken of by professionals as problems:

1 Lack of time to talk to clients/families

2.Busy ward environments

3.Lack of resources to care

4.Fast turnover of patients

5.Staff shortage

6.nonavailability of support staff to carry out many of the assisting interventions (basic nursing skills)

7. Professionals with qualification spending less time with clients and using assistants for such communication

8. Authority/responsibility problems in healthcare delivery

The support staff like qualified music therapists in each hospital will be of help to avoid such problems and will help the busy expert to get a clear picture of the client and family .

Communication skills to be developed :-

It is essential to enhance communication skills of students, residents and established practitioners of Medicine, Provide learners, facilitators and programme directors with the research evidence and knowledge necessary to understand and teach this vital subject , and convince medical educators of the importance of developing extensive and excellent communication skills teaching within their institutions.

1. Doctor-patient communication is central to clinical practice
2. Communication is a core skill, an essential component of clinical competence
3. Communication skill has to be taught and learned
4. Specific teaching and learning methods are required in communication skills training
5. Communication is not just “being nice” but produces a more effective consultation for both therapist and client
6. Effective communication significantly improves accuracy, efficiency, supportiveness; health outcomes for patient; satisfaction for both doctor and patient; the therapeutic relationship
7. communication bridges the gap between evidence-based medicine and working with individual patient
8. The skill promotes a patient-centered or relationship-centered approach that promotes a collaborative partnership between patient and health professional

Types of communication skills and how they interrelate?

1. Content skills:- What a professional communicates. The substance of their questions and responses , the information they gather, and give , the treatment they discuss

2. Process skills :- How they do it- The ways in which they communicate . How they discover the history or information/data , the verbal as well as nonverbal skills they use, how they develop a relationship with patient , the way in which they organize and structure a communication

3. Perceptual skills –What they are thinking and feeling-Their internal decisionmaking, clinical reasoning, problemsolving skills, attitudes, awareness of thoughts and feelings about patient, about the illness and the issues that may be concerning them, awareness of self-concept, confidence, of their own biases and distractions.

These three are inextricably linked and cannot be considered in isolation.

The Calgary-Cambridge guide (1998) defined the skill-based curriculum built upon 4 main elements which influence “what to teach and learn” in skillbased communication programmes.

1.Structure:- How do we organize our communication skills? Enable a flexible but ordered wellplanned interview. Encourage the client to be a part of the structured process. (participation.collaboration) Time management and Resource management appropriately are key words.

2.Skills:- What are the skills that we are trying to promote?

3.Validity:-What evidence is there that these skills make a difference in doctor-patient communication?

4.Breadth:-What is the scope of a communication curriculum?

The enhanced guide (2003 Kurtz et al Marrying content and process in clinical method teaching :Enhancing the Calgary-Cambridge guides .Acad Med .78:802-9) <sup>6</sup>included :-

Developing a framework of three diagrams that visually and conceptually improve the skills teaching and place communication process skills within a comprehensive clinical method. Devising a new content guide for medical interviewing that is more closely aligned with structure and process skills of communication skill training. Incorporating the patient’s perspective into both process and content aspects of the medical interview.

The three diagrams :-

1 Basic framework.

PROVIDING STRUCTURE	Initiating the session	BUILDING THE RELATIONSHIP
	Gathering information	
	Physical examination	
	Explanation and planning	
	Closing the session	

2.Expanded framework:-

Providing structure	Initiating session	Building relationship
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1.Making organization overt 2.Attending to flow	1.preparation 2.Establishing initial rapport 3.Identifying the reasons for the consultation	1.Using appropriate nonverbal behaviour 2.Developing rapport 3.Involving the patient
	Gathering the information  .Explore patient's problems to discover the  1.Biomedical perspective  Patient's perspective  3.background information-context	
	Physical examination  Medical diagnosis  Pretest levels	
	Explanation and planning  1 Providing correct information  2.Aiding accurate recall,and understanding  3.Achieve a shared understanding:incorporate patient's illness framework  4.Planning:shared decision making	

	Closing session  Ensure appropriate point of closure  Forward planning –follow ups etc	
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## THE INTERRELATIONSHIP BETWEEN CONTENT AND PROCESS

<p style="text-align: center;"><b>GATHERING INFORMATION</b></p> <p>Process skills for exploration of patient's problems</p> <ol style="list-style-type: none"> <li>1. Patient's narrative</li> <li>2. Question style: Open to closed cone</li> <li>3. Attentive listening</li> <li>4. Facilitative response</li> <li>5. Picking up cues</li> <li>6. Clarification</li> <li>7. Time-framing</li> <li>8. Internal summary</li> <li>9. Appropriate use of language</li> <li>10. Additional skills for understanding the patient's perspective</li> </ol> <p style="text-align: center;">Contents to be discovered are</p> <p>Biomedical perspective and Patient's perspective</p>
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Biomedical perspective-Disease	Patient's perspective-Illness
Sequence of events	Ideas and beliefs
Symptom analysis	Concerns
Relevant system review	Expectations
	Effects on life
	feelings
<b>BACKGROUND INFORMATION-CONTEXT</b>  1.Past medical history  2.Drug and allergy history  3 Family history  4.Personal and social history  5.Review of symptoms	

Goal of communication skills in healthcare:-

Increasing accuracy,efficiency and supportiveness

Enhancing patient and physician satisfaction

Improving health outcomes

Promoting collaboration and partnership(relationship –centered care)

Principles that characterize effective communication:-

1.It ensures an interaction rather than a direct transmission process. The feedbacks are received and the interdependence of sender and receiver of message , contribution and initiative of both become equal in importance.(Dance and Larson 1972. )<sup>7</sup> The aim of communication becomes the establishment of a mutually understood common ground.

2.It reduces unnecessary uncertainty . Uncertainty distracts attention and interferes with accuracy, efficiency and relationship building and leads to lack of concentration and anxieties. This blocks effective communication between two people.



3.It requires mutual planning and thinking in terms of outcome. If a person is angry , the outcome he seeks is just to vent his emotion and he proceeds only in one line. But if the outcome I want is solution of a problem, I want to resolve any problem or misunderstanding that may have caused my anger, and I must proceed in a different way (not just a vent of emotions) in order to be effective. So, in any relationship between two people, two communities, between two nations one has to think of a way to resolve the problem by mutual, logical thinking and planning . This is needed in a healing situation too.

4.It demonstrates dynamism. What is appropriate for one situation/disease may be inappropriate for another situation/disease. Different individual's needs, contexts change continually. What is comprehended yesterday in a person may appear beyond comprehension today, when he/she is having a disease. Dynamism underscores the need not only for flexibility but also for responsiveness and involvement , for engaging with each patient/each disease situation .

5.It follows the helical model.The helical model of communication (Dance 1967)<sup>8</sup> has two implications. First,what I say influences what you say in a spiral fashion so that our communication gradually evolves as we interact. Secondly , reiteration and repetition, coming back around the spiral of communication at a slightly different level each time , are essential for effective communication.(Page 35-36. Skills for communicating with patients.second edition.Jonathen Silverman,Suzanne Curtz,Juliet Draper .Radcliffe publishing 2005 )<sup>9</sup>

The task of communication skill teaching is to give participants the opportunity to try out phrases and behaviours that fit their own individual personalities and to extend the repertoire of skills with which each participant is comfortable.

Structure: Where am I in the teamwork and what do I want to achieve?

Specific skills: How do I get there and what skills I should develop for it?

Phrasing or behaviour:- How can I incorporate these skills into my own style and personality?

Going beyond specific skills into individuality is a real challenge of experiential learning . Therefore each of the Music Therapy Faculty students have to take up this challenge and make the utmost to develop communication skills.

THE DISEASE-ILLNESS MODEL (LEVENSTEIN ET AL 1989 AND STEWART ET AL 2003)<sup>10,11</sup>

Patient presents the problems
Gathering relevant informations

Parallel search of two frameworks	
Weaving to and fro between the two frameworks	
DISEASE FRAMEWORK (biomedical perspective)	ILLNESS FRAMEWORK (Patient perspective)
Symptoms  Signs  Investigations done  Underlying pathology diagnosed  Differential diagnosis	Ideas  Concerns  Expectations  Feelings, thoughts  Effects on life
Integration of the 2 frameworks	Understanding patient's unique experience of illness
Explanation and planning	
Shared understanding and decisionmaking	

Process skills of information gathering :-

1.Exploration of patient's problems	2.Additional skills for understanding patient's perspective	3.Encourages expression of feelings
Patient's narratives	Actively determines and appropriately explore patients ideas( beliefs etc)	Can Use music as rapport (music in therapy )  MLP .Acts as Theragnosis
Questioning techniques	Concerns(worries,regarding each problem)	Warmth,friendliness  Acceptance of ideas of patient
Listening skills	Expectations-goals	

	What patient expects for solution of each problem	
Facilitative response – verbal/nonverbal(encouragement,silence, repetition,paraphrasing,interpretation )	Effects of each problem on patients life	
Cues.(body language,vocal cues,facial expression are picked up	Knowledge of anthropological and crosscultural studies is an additional skill that help in exploring patient perspectives	
Clarification		
Timeframing (date,sequences-documentation) and internal summary		
Language skills		

Five distinct communication patterns in therapist /client relationship:

1.Narrowly biomedical .Closed end medical questions and biomedical talk (as done in today's medical practice)

2.Expanded biomedical:-Restricted pattern but with moderate levels of psychosocial discussions

3.Biopsychosocial .Reflecting a balance of psychosocial and biomedical topics

4.Psychosocial characterized by psychosocial exchange

5.Consumerist .Characterised primarily by patient questions and physician information giving (as we see in many TV Channels and sometimes in hospital practice too).

As clinicians develop subject expertise they adopt increasingly sophisticated approaches to clinical reasoning (logic).

Clinical reasoning	

<p>1.Hypothetico-deductive(number of hpothesis.Rule out each)-Students.</p> <p>2.Schema-driven(mental flow diagrams .Inductive reasoning,Fast navigation through welldefined problem area)</p> <p>3.Pattern recognition .With experience in career accumulation of details,key features of specific conditions as templates of memory structures called illness scripts.When a specific problem occurs,searches this reserve bank of scripts to recognize a pattern.Then test it for goodness of fit by further enquiry.This is an essential skill developed by seing a large number of similar problem cases and is not available to a fresh student/or PG .</p>	<p>Increase in subject expertise</p>
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Skills for building the relationships:-

Appropriate nonverbal communication	Developing rapport	Involving the patient
<p>1.Nonverbal behaviour :-</p> <p>Eye contact,facial expression,posture,</p> <p>Positions,movement,</p> <p>Vocal cues like rate,volume</p>	<p>1.Acceptance :the views and feelings accepted</p>	<p>1Sharing thoughts</p> <p>Encourages patient's involvement</p> <p>MLP is for that</p>

<p>intonation</p> <p>2.Use of notes.</p> <p>Reading,writing,notes or using computer done</p> <p>Without interfering with dialogue or rapport</p>	<p>2.Empathy.understanding ,appreciation of feelings,views</p>	<p>2.Provides rationale</p> <p>Explain the rationale for questions or procedures etc .</p>
<p>3.Pick up patient's nonverbal cues.</p> <p>Body language,speech,facial expression,</p> <p>Acknowledge them as appropriate</p>	<p>3.support</p> <p>Express concern ,willingness to help.appropriate selfcare acknowledged.offer partnership</p>	<p>3.Examination</p> <p>Explain the process,and ask permission from client</p>
	<p>4.Sensitivity.</p> <p>Deal sensitively with embarrassing disturbing topics and physical pain</p> <p>During physical examination ,counselling etc</p>	

What is nonverbal communication?

- 1.Posture: sitting,standing,erect,relaxed etc
- 2.Proximity: use of space , physical distance between and positioning of communicators
- 3.Touch: Handshakes, pats, physical contact, physical examination
- 4.body movements; hand and arm gestures, fidgeting, nodding., foot and leg movements
- 5.Facial expression:- raised eyebrow, frown, smile, crying
- 6.Eye behaviour: eye contact , gaze, staring

7.Vocal cues:-Pitch, rate, volume, rhythm, silence, pause, intonation, speech errors

8.Use of time: early, late, on time, over time, rushed, slow to respond

9.Physical presence:- race, gender, body shape, clothing, grooming

10.Environmental clues:- location, furniture placement, lighting, temperature, colour.

Priest and Speller ( 1991. The risk factor management Manual .Radcliffe medical press.Oxford )<sup>12</sup> cited three sets of skills in which the practitioner needs to be effective in order to help a patient change to a healthier lifestyle.

1.Knowledge about the risk factors of the disease

2.Awareness and understanding of the patient's attitude to the problem affecting his/her health

3.Knowledge and application of skills involved in helping people to change

Motivational interviewing utilizes these three sets of skills to foster the individual's desire to make behavioural changes (Miller and Rollnick 2002.Motivational interviewing.Preparing people for change .Guilford press.New York)<sup>13</sup>. Motivational interviewing is based on the stages of change Model .

Intervention using stages of change model for Motivational Interviewing:-

Start at Precontemplation:- Feedback patient's views to instill the awareness of the problem (Cognitive dissonance) . Here explore the health beliefs and establish a readiness for change in lifestyle.

2.Contemplation stage. Reflect positive statements to enable patient to reach a decision about positive change. At this stage only a premature way out is possible.

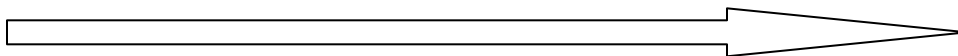
3.Active stage. Give information , provide choices for action, Agree target . Provide skills and support.

4.Maintenance: Provide appropriate follow up, individual or group support. Consider community support network. This is the optimal recovery stage and change is consolidated

5.Relapse.If patient does not return , send further invitations . If patient returns , explore difficulties with change and attitude.

Can you change the behaviour for positive thought within a 50 minute counselling session ? Yes . It is possible according to the Keller and Kemp white (2001 ) model of conviction and confidence grid .(page 196 of Jonathen Silverman et al) <sup>14</sup>

HIGH 10	
<p>Stuck : Frustrated</p> <p>This is important.But I don't know where to start .I haven't been very successful in the past .</p>	<p>Moving:Committed.</p> <p>I think this is important and I am going to do it no matter what the obstacles are.</p>
<p>Stuck:Unaware/critical.</p> <p>This is impossible and I don't want to bother with it anyway</p>	<p>Stuck: Sceptical.</p> <p>I could do this.But it is not worth the energy .</p>
LOW 1	HIGH 10



Confidence
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Skills (modified from Calgary –Cambridge guides) for communication:-

Skill	Applying skill with depth,intension intensity
<p>Initiation</p> <p>Greeting patient</p> <p>Making introductions</p> <p>Demonstrating interest ,concern,respect</p> <p>Attend to patient's physical comfort</p>	<p>Success in setting the scene (as in any other interview)For a child the environment should include toys,picturebooks etc .Engage the child through play ,neutral chat or by establishing rapport with parents.You have to adjust to the child's comfort levels accordingly..</p> <p>Pronouncing patients name correctly</p> <p>Sensitivity to patients wish to be interviewed in presence of friend/relative</p> <p>Help of interpreter if needed</p> <p>Gender issues to be respected</p>

Preparation	<p>How to set up appointment.special thought and systematic planning.</p> <p>When and where ?</p> <p>Who should be there?</p> <p>Emotional as well as factual preparation for the task.</p>
Negotiating the agenda	<p>Usually you have to interview more than one person,since patient is accompanied by a relative/friend .That is be prepared to meet people with different ideas ,concerns,expectations and different agendas.Focus on the main patient .But take into consideration the accompanying friend also .It is better to see both patient and the accompanying person,separately as well as together if time permits.</p>
Explanation and planning	<p>Masterful use of most of the skills associated with is needed for this</p>
Chunk and check	<p>Give information in manageable chunks and check for understanding .This allows us to calibrate the patient's present status at that particular time of interview</p> <p>Use appropriate language</p>
Assess patient's starting point	<p>Discover what the patient already knows.His hopes,fears etc.Getting an accurate picture is vital before giving information and for starting therapy and for assessing progress,prognosis.This sets a scene for excellent relationship between therapist and client in the future</p>
Assess each person's individual information needs	<p>Discover what the patient wants to know .Gauging how much the patient knows and</p>



	<p>wants to know requires high levels of skill.Needs and preferences of individual is assessed here.</p> <p>Direct preliminary questionnaires,informal talks and interviews,etc are used for this and follow up done</p>
Use explicit categorization or signposting	Give a shot of information (signpost of information) alerting to the facts.This depends on patient's situation and therapists style.(requires lot of Manodharma in each individual case and on spot decisions)
<p>Relate explanations to patient's perspective</p> <p>Discuss options and opinions</p>	<p>Give hope tempered with realism.(recovery,partial healing or selfhelpcure possibilities etc).Discover the patient's own coping strategies and its potentials.All patients need hope and optimism .Therapists are not Gods and they may not give a total cure or a complete recovery from a severe illness.Both these facts are to be remembered</p> <p>Treatment options – recommendations,and then discussions to know whether the patient follows it or not</p> <p>Give a prognosis.The timescale of cure is not a very definite one but the hope that by continued change in lifestyle healing can happen has to be told.Give a broad framework to help patient who wishes to plan ahead</p>
Building relationships	<p>With patient and family/relatives/friends</p> <p>A trusting relationship comes from knowing the patient and his needs</p>
<p>Pick up cues</p> <p>Demonstrate empathy</p>	<p>Check nonverbal cues to calibrate emotional state .Have compassion for his position.Think from his/her perspective.</p> <p>Verbal cues and nonverbal cues(silence</p>

	,tears,uncomfortable,angry etc)gives clues to act with empathy
Provide support	Partnership,advocacy .State that we have to work together as a team to the patient and relatives .
Demonstrate appropriate nonverbal behaviour	Patients are upset by doctors who have no concern for what they feel and who does not listen to their woes.The patient picks up your nonverbal cues .So be perfectly at ease and not distressed and have total empathy to their state .Do not burden them with our distress .Give positive lessons from our experiences.
Closure	Time spent on such an interview pays dividends.Summarise possible nextsteps and give them feedback and control of their situation
Next step and safety net	<p>Clear follow up plans</p> <p>Next appointment date</p> <p>Give telephone or contact email id</p> <p>Supportive and reassuring gestures</p> <p>Treatment options</p> <p>Document whatever the patient/relative has informed with the findings you have made.</p> <p>The communication of family physician(music therapist)and the specialist doctor through such documents will help the patient immensely</p> <p>A team of healthcare providers with proper documentation like this will take care of the physical and mental emotional,intellectual needs of society effectively</p> <p>Documentation and follow up is essential for research as well .</p>

A telephonic interview :-

1.Initiation: Answer the call or return the call promptly

When you initiate a call , check that you have all relevant information in front of you before you pick up receiver

Make introductions: Check that you are talking to the correct patient .

Develop rapport : use tone of voice and supporting statements early in order to develop rapport

2.Gathering information:-

Listen actively: Give verbal encouragement to continue , rather than listening in silence

Gauge emotional state: pick up cues , respond clearly and verbally

Clarify: carefully clarify the clinical story , using appropriate direct questions

Discover the patient's framework: Clarify patient's ideas, concerns, expectations, before proceeding to explanations and planning

3.Building relationships:

Demonstrate empathy , acceptance and sensitivity and provide support . These have to be demonstrated repeatedly and verbally over the phone

4.structuring interview:

Use the internal summary and signpost. Use these two skills in tandem more frequently when you cannot see the patient in order to clarify transitions between open and closed questions , the disease and illness frameworks and explanations and planning

## 5.Explanations and planning:

Chunk and check understanding and agreement verbally , not by nod of head etc

Use clear language free from jargon, and at moderate pace. Especially if connection is of poor quality this becomes essential. Give idea about prognosis, in case a face-to-face discussion is not planned

Offer options: do this before trying to agree a management plan

Negotiate a management plan: check that the plan is acceptable. This will reassure patient .Encourage to repeat the advice you have given .

Ask whether there are any doubts, questions etc

6.Closing: summarise and check; safety net. These three skills need particular attention over the telephone. In order to be clinically safe and to maintain rapport and patient's confidence.

How to uncover hidden depressions and psychosis etc ?

Accurate diagnosis depends upon the skill of doctor. The psychologic interview differs from all other medical interviews in that mental health examination is an integral part of the process. Interview is history as well as examination simultaneously. The interviewer has to have a rapport and has to help patient to give all informations possible . That is allowing the patient to open up is the skill needed . The tool of music and the rapport of a effective MLP is essential for this . The questionnaires and the informal interviews and the MLP alone can give you a very good tool for uncovering any depression, anxiety lurking in the patient's mind and you can deal with it effectively with music . I have not tried this in psychiatric patients. Because in overt psychiatric cases the possibility of a concentrated mind for music or MLP may be less .

But in common man with numerous psychological problems this has been used effectively . This reduces anxiety, stress and strains of life and makes one less prone to stress-related disorders . Flexibility and open and closed questioning is important in all interviews .

Other communication issues:

Ethical issues

Gender issues

Informed consent

Interviewing patients with sexual or genitourinary problems

Disease prevention and health promotion issues/changing behaviour

Explaining risks

Talking with patients who have sensory impairments

Patients with low literacy

Communication during ward rounds

Death, dying, bereavement, near-death experiences

Anger and aggressive behaviour and how to cope with them

Handling complaints

Malpractices

Interviewing and intervention for alcohol and substance abuse

Talking with patients in intensive care –acute life-threatening diseases or injury

Ending the doctor-patient relationship

In communication skill teaching there is a fine line between teachers and learners. Teachers continue to make discoveries about communication throughout their professional life and learn from generations of students. The learners become teachers of next generation formally , informally as role models . No one can escape this responsibility in this human life . Being a human being first, a teacher and a doctor and a person who communicates with readers through books and to audience through speeches , I have learned the communication skills throughout life and what I have presented here is for the music therapists of the next generation to learn and practice and give as models to their next generation learners .

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## Chapter 10

### Stress tests

1 .Find out whether you are under stress. Check the list of symptoms and notice whether they affect you only occasionally ,often or always.

1 I get nervous , anxious

2.I feel overexcited

3.I worry too much

4.I become confused and forgetful

5.I have difficulty in concentrating

6.I feel irritable most of the time

7.I get depressed

8.I feel bored and apathetic

9.My heart pounds

10.I breathe rapidly

11.I get stomach upsets easily

- 12 I feel lighthearted or faint
- 13. My feet and hands become cold
- 14. I perspire easily
- 15 I have to pass urine often
- 16. I get diarrhea and/or constipation
- 17. My blood pressure is high
- 18. My face feels flushed
- 19. I cant sit or stand for long
- 20. My muscles are tense and stiff
- 21. I stutter or stammer
- 22. I have a nervous twitch
- 23. My hands and fingers tremble
- 24. I clench my jaw and grind teeth
- 25 I get headache or eye aches
- 26. I have low backpain
- 27. I am becoming withdrawn
- 28. I am shorttempered
- 29. My appetite changed rapidly (eating too little or too much)
- 30. My sex drive is increased or decreased
- 31. I oversleep
- 32. I cant sleep
- 33. I have minor accidents and make more mistakes
- 34 I am using more drugs ,alcohol,medications
- 35 I always feel tired

Stress test 2 .By Psychologist Lyle H Miller and Alma Dell Smith (Boston Uty Medical center).Modified to suit our purpose.Score each item from

Almost always 1

Once a month 2

Once a week/day 3

Only very occasionally 4

Never 5

Rate yourself accordingly .

1.I eat at least one hot balanced meal

2.I get 7-8 hrs sleep

3.I give and receive attention regularly

4.I have at least one relative within 80 Kms of my house on whom I can rely

5.I exercise to the point of perspiration

6 I smoke less than ½ a pack of cigarettes

7.I take five alcoholic drinks

8 I have appropriate weight for my age

9.My income is adequate to meet my basic requirements

10.I get strength from my beliefs/religious/spiritual/or secular

11.I regularly attend social activities

12.I have network of friends and acquaintances

13.I have one or more personal friends in whom I can confide my personal matters

14 I am in good health(including eyesight,hearing etc)

15.I am able to speak openly about my feelings

16 I have conversations with my people at home,at office etc

17.I involve in entertainment or hobby



18.I am able to organize my time effectively

19.I drink less than 3 cups of coffee/tea/cola

20 I take a quiet time for myself

How to get the score: Add up the score.Subtract 20.

Over 30 indicate vulnerability to stress

Between 50 and 75 seriously vulnerable

Over 75 extremely vulnerable

Test 3 Holmes-Rahe stress scale (Thomas Holmes and Richard Rahe ) based on survey of 5000 people

Event	Stress point
1.Death of spouse	100 %
2.Divorce	73
3.Marital separation	65
4.Jail term	63
5.Death of close family member	63
6.Personal injury/illness	53
7.Marriage	50
8.Fired from work	47

9.Marital reconciliation	45
10.Retirement	45
11.Change in health of family member	44
12.Pregnancy	40
13.Sex problems	40
14.Gain of new family member	39
15.Business readjust,ment	39
16.Change in financial state	38
17.Death of close friend	37
18.Change to different style of work	36
19.Change in number of argument with spouse	35
20.Mortgage more than USD 10000	31
21.Foreclosure of mortgage/loan	30

22.Changed responsibilities at work	29
23.Son/daughter leaving home	29
24.Trouble with in-laws	29
25.Outstanding personal achievement	28
26.Wife begin or stop work	26
27.Beginning or end of school	26
28.Change in living condition	25
29.Revision of personal habits	24
30.Trouble with boss	23
31.Change in work hours or conditions	20
32.Change in residence	20
33.Change in school	20
34.Change in recreation	19

35.Change in church/religion	19
36.Change in social activity	18
37.Mortgage/loan less than USD 10000	17
38.Change in sleeping habits	16
39.Change in number of family gettogether	15
40.Change in eating habits	15
41.Vacation	13
42.Festival/Christmas	12
43.Minor violation of law	11

That means life itself is the stress . But the way people react to the same event varies. It is not the event but your own ability to cope with it that matters. For example, I had the experience of my spouse' death at my 48<sup>th</sup> year (which according to Holmes is 100% stress ) but I coped with it well and it never left a stress symptom over my personality. It was because of my philosophical background, my musical and literary preferences and also my lifestyle which includes a background of Medical profession and that of a teacher .When duty demands, a soul which had gone through philosophical discourses, will not succumb to any stress even if that is a 100 % stress according to the Psychoanalysts. For this, I myself am an example.

Holmes showed that in a sample of 88 Doctors ,with 300 or more on the scale had 70 % chance of suffering ulcers, psychiatric disturbances , broken bones or other health problems within 2 years of various crisis. Those who scored under 200 had only 37 % incidence of such problems. They could predict by adding up the life stresses of healthy football players , which ones would be injured the next season.

By singing keertans one is able to withdraw oneself from the body, external environment and stressful experiences. Kirthan relax mind and is called a Yogic Tranquilliser . It cause the fast moving beta waves of brain to change to slower relaxed alpha rhythms. Alpha denotes condition of mind when one is within internal space detached from external space. The relaxed state enable us to achieve steady , onepointed tranquil state of mind . The calm waves makes a calm personality and is a sign of stress relief. When man's thoughts are corrupted there is no control of mind and stress happen. The desires and passions tossing mind keeps it tense. The involvement in Keerthan and Yoga and disciplined mind leads to mature, calm peaceful personality . The role of music was known for this property of calming mind for Yogic concentration from early times. Now the modern techniques and research protocols of medicine is finding that this is happening through action of the brain waves, by the neurotransmitter substances and also immunological enhancement to prevent all disorders. Hence the branch is a Neuropsychimmunological research as far as Music Therapy is concerned.

Apart from the EEG, Hormonal and other measurable parameters , what is the psychological mechanism that reduce stress through musical communication between therapist and client?

Effective human communication is one of the important factors that reduce stress. Learning to communicate to express our needs and emotions instead of suppressing them inside help to reduce stress and calm mind. Music is the best communication between two souls . And through that , humans forget all sorrows and this universal language is used by therapist for stress relief . The art of conversation is an important aspect of human life essential for communication but it is not the language itself but the Bhaava and the Sthobha in it that really communicate the emotion and that is what music is all about. In fact from a person's speech (and music) a person's personality as well as what he/she wants to convey is better communicated than anything else. The voice, the tone, the pronunciation, the diction, the vocabulary, and sentence construction etc make a strong contribution to the personality. Because of this the improvement of voice and speech is important for improving communication, for healing as well as for personality development. Personality of a person is what people think about him/her and character is what he/she really is. Character is aquired through self-discipline and firmness of conviction.

Good communication means shared conversation which involves speaking/singing as well as listening. If no one listens there is no communication. The communication is an exchange of ideas through speaking/singing and listening . Therefore a good conversationalist /Music therapist has good communication skills of both types. For communication skills one should improve

- 1.Ability to get along with people
- 2.Ability to express clearly , concisely and convincingly
- 3.speaking, listening , verbal exchange of ideas
- 4.habit of listening to others. On an average efficiency of a person in listening to others is ten to 25 %.
- 5.Able to start conversations to the topics familiar and liked by the listener , to the interest of the listener. That is why the therapist has to start with musical preference of listener
- 6.One has to appreciate people with whom you converse
7. imagination and select vivid picturesque words to colour the speech
- 8.Should be tolerant to views of others. If you totally disagree it is better to keep silence for the time being instead of being aggressive . Avoid strong arguments and using bad language against anyone
- 9.Conversation with different types of people can be enjoyed by a tolerant conversationalist only. A therapist is to meet different types of people and therefore this talent has to be developed for helping all types of people.
- 10.Voice and speech should reflect the sincerity of purpose . It should express the real person within us .
- 11.A good conversation does not happen by chance. Only when people have a mind and intellect developed beforehand by a lifetime effort , they are able to converse and share freely and sincerely with others.
- 12.A good conversation is not a gossip about the defects of others but a very positive psychological help and that should give confidence and improve the quality of the listener .
- 13.A person who help others should be able to listen to their needs, experiences with a compassionate mind and provide positive feedback to improve their life and personality
- 14.Nine conventional topics which a common man will like to hear and can converse about are,films, music, newspapers, arts, magazines and books, newspapers, social activities, special cultural interests and hobbies. Starting with such subjects a person can slowly help the people. Of all these the best is music because it does not carry gossip or bad stories or any adverse things and is best for conveying love,compassion, devotion etc.
- 15.Learning to love people and all living things is essential for a compassionate therapist. .Genuine interest in all living things and their wellbeing has to be there in the therapist .
- 16.A broad outlook , a wide range of interests and a sharing of activities , reading and listening are helpful for all these.
- 17.Selfconfidence is also a factor for a good therapist .

18.Flattery seldom works but a smile is a healing tool and sincere love is that which stands the test of time in the face of all adverse experiences. And for a Music therapist , the best gift from a disciple will be involvement in the professional work shown by the people , and not just flowery words or awards . And that is what is very rare to find. But such rare people I did find in my sojourn through this hard professional journey .

19.Do not forget that people come to you needing attention, sincerity, encouragement and even adults are really having a hidden child within which craves for sympathy and motherly love .

20.In dealing with worry , have a sincere and compassionate ear to the sufferings of the person concerned. A loving word and a helping hand and an encouraging system of wholistic care may do wonders for reducing worry and stress.

Below a schematic chart of personality is given. The upper half is the Unstable and the lower half is the stable personality. The left half is the Introverted and the right side is the extroverted personality. A balanced personality has to be developed.

#### UNSTABLE

Moody	Touchy
Anxious	Restless
Rigid	Aggressive
Sober	Exitable
Pessimistic	Changeable
Reserved	Impulsive
Unsociable	Optimistic
Quiet	Active
Passive	Sociable
Careful	Outgoing
Thoughtful	Talkative
Controlled	Responsive

Eventempered	Easy going
Calm	Lively
Reliable	leadership

## STABLE

To give confidence and induce positive thinking in others we have to inculcate them in ourselves first.

The Art of Positive thinking by Affirmations is to resolve to yourself that you are what you want to be. This helps you to achieve the Goal you seek .

What are the affirmations which help to lift your self esteem?

1.I love myself, my Athman. And since Athman is same in every living being I love all living beings as myself. I do not harm anyone by deeds, words, or thoughts.

2.I am able to focus/concentrate on anything I choose effortlessly .

3.I am able to recall my knowledge when a Practical situation so demands

4.I am an excellent speaker/communicator

5.I start each day with joy , energy and a blessing for all living beings

6.I share my inner peace and happiness with others, through my words (spoken/written) deeds and thoughts and prayers

7.Everyday I become more and more wise, compassionate and openminded and effective in communicating my feelings and thoughts with a positive result

8.In my own inner world I feel satisfied and happy because I have lived a full life of love, and knowledge combined with actions for the good of all .

9 I do not waste my time in idle talk and use every moment of it for improving myself and through that the world in which I live in

10.I am an Athman and not this perishable body or mind , and no disease or destruction happen to that Athman which is the real Me , and whatever that I think, do and speak /communicate will be forever remaining in this world for the sake of welfare of all beings



11. Whoever comes in contact with me gets a share of my goodwill so that a change happens in their outlook and their life becomes more fruitful for the sake of the society.

12. I love my students, my patients, my friends and relatives and even those whom I have not seen and that love is my source of strength ..

The messages we give to ourselves in this way, affect our own personality, self-esteem and make our relations with others more fruitful and pleasant . If a negative message is passed on by someone, either ignore it, or if that message is being repeated avoid such people who pass on negative messages to belittle our self-esteem. Only a person who has a positive outlook will get perfect satisfaction and happiness and will be devoid of diseases and sorrows .

## **Chapter 11 Music Therapy in Smrithy (Memory ) and Smrithinaasa (Loss of memory):-.**

### **Part 1**

In the second chapter of Bhagavad Geetha ,Smrithinaasa (loss of memory)and as a result of it, Budhinaasa(loss of intellect) are mentioned by Bhagavan Sri Krishna. Samsara leads to this Aamaya (disease)and to be Niraamaya,(free from disease)bondage to samsara has to be lost .

When my mother's sister, Poet Balamani Amma ,lost her memory in old age ,my son wrote a poem (Which appeared in Keralasahitya Academy journal , Malayalam Literary survey Oct –Dec 1996 No :4 page 96).He wrote :-

For me,

She was art

Which as they say

Is impersonal ;.

And that day

Her croaked voice  
Faltering,  
Breathless in spurts  
Recited through the recorder  
Some rare moments  
Reduced  
To a Laser-magnified page.

I longed for life;  
The real  
Just as she too  
Would have longed for it.  
Only the spools  
Of the tape worked  
That of the memory  
Didn't.

It was a sad sight to see her like that. The pain which we suffered was intolerable. She could not recognize her own daughters and sons and used to call them Ammini, which is my mother's name. The only memories that remained were that of her ancestral house with *Ammaman* (her uncle and Guru Poet Narayanamenon), her mother and sister Ammini. No one else existed in her memory. Sometimes she spoke of a temple and a Devi inside and also that her husband is taking a bath and requires dress when he comes back (and kept dress ready for him. He was dead several years back and she did not remember it).

I tried some old poems and when I sang *Kannuneerthulli* (Teardrops) she recognized it as her uncle's poetry. When I recited four lines from her own poetry she said that must be by *Mahakavi Vallathol*. Only *Vallathol* can write such beautiful verse. She retained her aesthetic sense but not her own creation.

When my brother Asokan visited her and said “I am Asokan” she didn’t recognize him but recited a verse from Kalidasa’s *Kumarasambhava* starting with the word Asoka. And when I tried *Lalithasahasranaama*, her favourite which I remembered her reciting every day morning (while I was a child) she was able to recollect some of the verses and recited them along with me. That was in the middle stage of her illness. Then, after sometime when I saw her, she had become totally forgetful and continued like that till her end.

I had seen such incidences of amnesia in my family and in others .

1. My father’s elder sister ( mother –in-law of KamalaDas)

2. His Younger sister Leelavathy Amma .

3. Another sister Kamalakshi Amma

4. A brother of him .

And I had heard of such incidences in the great intellectuals like Kuttikrishna Marar (Malayalam literary critic) , a great friend of my grand uncle .. So this can occur to common man as well as intellectuals alike. But it is not mandatory that all in the family should have it. My mother, my grandmother’s mother, my father etc lived upto 92-93 and even more , with excellent memory till the day of death. I had taken histories of 9 elderly people in a carehome and found different results with music and related activities in them. And in my book *Music therapy in management , Education and administration* (Readworthy publications New Delhi ) I had given a project for such institutional documentation and a case history of music being useful in a person with Alzheimers dementia. Here I discuss the amnesia , its pathways , its uses as well as disadvantages to individual and society . There are some clues given to keep a good memory at the end which may be of help both to students and professionals, for housewives and for every one.

## **Amnesia or loss of memory :-**

Normal human beings have a memory that is selective, vague and we forget certain things and if not so we would not have survived so long. Remembering every wound inflicted by every one and trying to pay back an eye for an eye would have wiped out the races . So forgetting and forgiving is inherent in human organism for survival of the races. The races which perpetuate violence and bloodshed will be wiped away from earth .. The sages of India practiced nonviolence because of this, and Christ asked his disciples to forget and forgive but modern scholars are perpetuating illfeelings against remote crimes which they think had been committed by ancestors of one race to another thereby perpetuating violence and separatisms. So forgetfulness of certain things are essential for human race for survival.

Why are the past happenings and experiences recorded as history? Just to learn from it and shape a better future, a better world for human beings ..Not for perpetuating feelings of enmity and perpetuate misery. The recording of past experiences as history is just to make us remember from that narrative that we have to learn to live as a single co-operative unit of human race to survive on earth. For that music , the universal language of all beings is useful.

Here, amnesia of a separate type is discussed. For daily routine life each one of us need to remember certain things. The words (language of communication) , names of people, places, dates for doing certain important actions, to carry out certain plans and locations and time for that etc. A driver has to remember the technique of driving a car and the traffic rules. A doctor or an engineer has to know his profession and remember it .Similarly every professional has a special memory of what is his/her day to day activity so that it is carried out efficiently .We have to remember the places where we have kept our things at home and office , and methods of keeping our body and premises clean. The foods which have to be eaten and the methods of its preparation and so on. In old age we find several people loosing this common day to day memory and this amnesia is called dementia . This is a major problem that we encounter in modern world.

Another problem of memory that we encounter is the perpetual remembrance of the painful traumatic incidents of individual as well as social and national life. The pain as a recurring memory is made perpetual by annual celebrations of painful memories . This replay, after the injury has healed , is like re-opening a wound after it has repaired well .This also is a problem which is leading different types of terrorisms and upheavals and violence in the world today.

How to reduce such painful memories? How to bring back memories that are needed for a day to day existence in the old age ? How to increase memory in a child who is learning in any educational institution? Can we use music for this purposes? Raagachikitsa has been addressing these questions .

## **Memory , learning and Recall of learning:-**

Memory is not a database of information storing, but is a dynamic process. Storage is only one aspect of it. Thoughts, emotions, perceptions and actions (all cognitive functions intertwined) are functioning as memory and therefore it is a dynamic process. There are minimum three stages in the process.

**1.Selection:-**Only a very tiny fraction of our daily experience is selected by our brain to be stored.Vast majority are not selected by brain and they are therefore as good as never experienced by us and forgotten soon.

**2.Lay-down:-** The selected ones are encoded (stored) for just a split second for a lifetime.Only those that go through an elaborate process of consolidation for at least a period of two years do stay back.

**3 Recollection:-** The memories thus stored may be inaccessible for re-collection. That means re-collection is faulty. Recollection is not a simple matter of reactivating stored information. It involves changing memories to incorporate new information. The fluidity of thought which help us to act intelligently come by this change. Sometimes forgetting of bad experiences in life is thus a good change for a human being. Forgetting the good things is a bad things to happen to any individual or society or culture.

Fig 1 Cortical areas of memory .(Canadian surgeon:- Wilder Penfield)

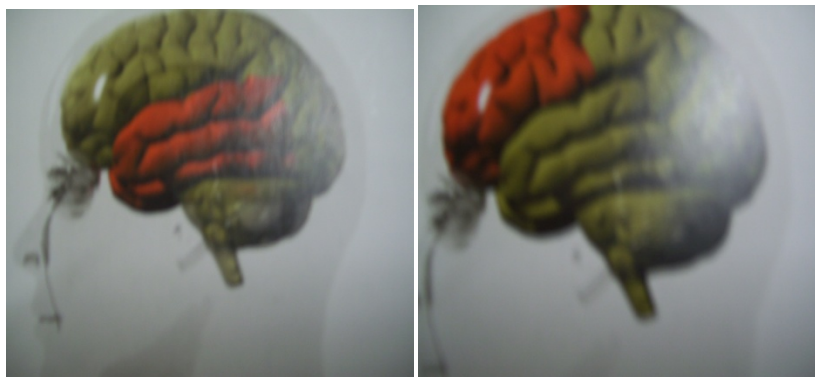


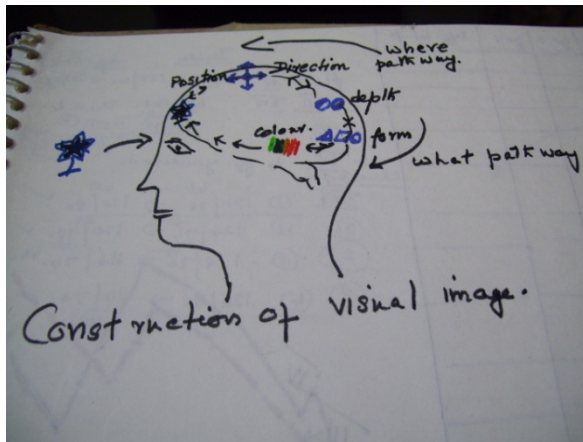
Table 1.

Stage	What happens	What goes wrong	Effects
Selection	Stores information which the brain thinks will be useful for a later date.Others pass by unnoted.	Important events may be neglected  Unimportant ones may be selected	Fail to recall a name .  But remember a mole on nose.
Lay down	Stored one associated with relevant pre-existing	May be misfiled or the process of lay-down may fail.	Name and the mole are lay down but do not connect them.  New events/facts do not go in.Old

	memories ,retained for a appropriate time.		memories more vivid than recent ones.
Recollection.	Current events should stimulate recollection of appropriate memories so that information can guide future action	Current events do not hook out useful memories.	Inability to remember words,names,routes,people,events.You know the information is there but cant fish it out or hook it out
Change	Alter a recalled memory to accommodate a new information.	Alteration can create false memories	Memory is different from the original perception.The change may be for good or for bad(which depends)
forgetting	If not refreshed memories lost.Unused memories can clogg brain.	Important ,useful information lost.Unessential,damaging ones kept	1.General forgetfulness.Feeling that I have forgotten something 2.Unwanted memories swamping thoughts.Like an image of suffering .

The world we experience does not really exist. Grass, sunshine, rivers, a melody, a fragrance does not exist as such green, warm, pleasant or beautiful but our brain makes them so. Everything outside and inside is energy only and the external energy in these things is converted by our bioenergy into such experiences . So the signals from outside is constructed by brain into pleasant and painful .The sights, sounds and smells etc are thus felt by us. When a lightray touch a eyeball nerve cells transform it to electrical and later to neurochemical energy . The same energy touching the ears is also converted in the same way but felt as a sound wave. The brain has a specialized function in each part of the sensory area corresponding to the sense organ of receipt of external cosmic energy.

Figure 2 Pathway of brain in constructing a visual image :-



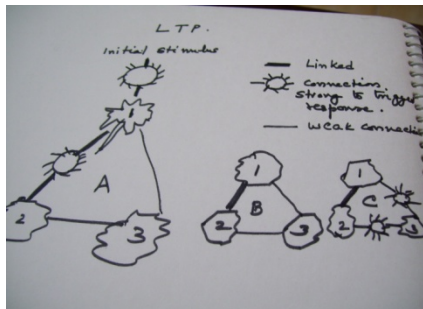
The forgetting curve devised by German psychologist Herman Ebbinghaus shows the rapidity of loss of nonsignificant memory. Forgetting takes place soon after learning. If it sticks for three days at least, it is set for a long future. Meaningful information has a far less steep forgetting curve. How to keep memory ? The answer is , By repetition by modern scientists.

What did our ancestors say about this? The repetition or practice (Abhyaasa) and japa (repeating names) and gunakoshta (multiplication tables ) every day was exactly for this purpose. A short term memory remains only till the time it is repeated. If we continue to repeat it even after we need it, it becomes a long term memory . Then our brain will never forget it. If you do it with your calculator , your brain will never store it , and without a calculator you cant do anything. So mental arithmetic is more useful for human race than a calculator . Eric Kandel of Columbia university (2000 Nobel prize winner) showed that short term memory involves changes in already existing synapses. He did experiments with mollusk Aplysia which has relatively few and large neurons.

Molecular changes that underlie memory are not directly observed in human brain. Researchers of Uty of California, Santiago found that when a neuron is stimulated once , a molecule called Actin moves towards neighbouring neurons. Actin is present in many cells throughout body and is associated with growth and cellular restructuring. The activity of the first cell stimulate the the neighbouring neurons. The changes are temporary and last for 3 – 5 minutes and disappear within 5-10 minutes. If the neuron is stimulated four or more times within an hour the cells creates new docking points or synapses with the neighbours creating an irreversible alteration in the cells wiring. The links between individual cells are formed by a process called long-term potentiation. Cell 1 as initially stimulatd activating cell 2 in a alert state of stimulation from cell 1 for hours or even days. Each time the 2 cells fire together their mutual sensitivity or link is re-inforced. Eventually they are bound together so firmly that they may fire together for the rest of the lifetime in brain. When their combined activity is enough to trigger a cell to which both are attached, even if the links are weak with it and if this happens repeatedly the 3<sup>rd</sup> cell is

also bound with the link of the first 2 cells. Memories are formed in firing of networks of neighbouring cells linked in this way.

Figure 2 LTP



The hippocampus is a formation which lies in the brain and records conscious experiences and then files some of them in other parts of the brain. Damage to hippocampus can cause profound memory disorders. The hippocampus does a lot of lay-down work when we sleep. During jagrad (wakened state) it is busy with selecting, processing and storing current information. In sleep this bombardment stops. The hippocampus starts to trawl over what it has recently dealt with. The neural pattern replay spontaneously and some of them appear as dreams. So in REM sleep if I have been dealing with astronomy an astronomy pattern is replayed. If I am dealing with chopping vegetables, a chopping vegetable neural pattern only will replay. The patterns of music and astronomy are juxtaposed in dreams of me when I deal with both. And if I deal with medicine as well that pattern also is juxtaposed and integrated. In the REM of a person who chops carrots, chopped carrots are juxtaposed in dream with images of other vegetables and other day to day activities. The hippocampus thus acts consolidating experience into memory even when we are in sleep, in a stage when we think we are unconscious of anything. It is in this state that it links the new experiences to the old experiences, filling in the web. So for a person who integrates knowledge this sleep stage is as important as the jagrad state when he/she learns. The storing of memories in different parts of the brain as a huge cobweb has to be thus understood. Each element of a memory – the sight, sound, word or emotion that it consists of – is encoded in the part of the brain that originally created it. Each one is the same as current perception, except that the information that created it comes now from within the brain, instead of externally via the sense organs.



Suppose we want to remember a *dravya* (matter/object)..The colour is processed in the visual cortex. The name of the *dravya* is in the language storage part of Broca. The sound of the *dravya* is in the acoustic area. To get a memory of the entire *dravya* each has to be linked and integrated. Think of a swara as a *dravya*. Its varna or colour , its dwani or acoustic part, and its form with length, breadth, area, height etc and its specific name and designation has to be correlated. All are one . But being stored in different areas by different sense organs these have to be integrated for perfect understanding. So with different disciplines in a sarvagna brain. The astronomy and musicology, the literature and philosophy, medical knowledge etc are stored and integrated in the same way. If you have only one sense developed and one area of brain associated with it developed , the knowledge remain imperfect. One thing reminds one of another if we have learned both or heard or seen or experienced both and make comparisons possible..The memory system allows new events and experiences to be integrated to old ones. The present with the past . A map of memory is made so that every time we need it we can recall it . A mother's image in a child is a combination of her sound, form, colour and moods and love and care and her softness or harshness integrated by all such sense organs and sensory areas. Even if the mother is no more the memory of the mother lives in every adult. Similarly with other loved persons/people/places/subjects etc. The use of this is that long term memories are made indestructible by storing them at different places in the brain. If in a single area of brain, and if that area is damaged, entire memory will be eradicated with one stroke.

When neutral sound tracks were presented to volunteers repeatedly the listeners hear voices that were not on the track. It is not subjective reflecting the listeners current state of mind. It is like Rorschach inkblot test in which people see meaningful images in a randomly splashed blob of ink. Women hear words of a romantic nature whereas men do not. And we expect people to hear the words in their native language more than an alien language . But this is not true. People can hear words which they have never heard before in another language and also before they have learned anything at all, in infancy itself. From where does the sounds come from a chaos of sounds to create a balance ?

Why listeners hear only words which are meaningful to them? Deutsch, in an American Uty played listeners two different pitched test tones that are separated by a time interval during which other tones are heard. Under these test conditions the listeners found it difficult to tell whether the two test tones are the same or different in pitch , even though they can ignore the other tones. But when spoken words are presented during this interval instead of other tones , most listeners had no trouble recalling the pitch of earlier tones. This experiment showed a striking dissociation between musical tones and spoken words in memory and indicated that separate memory stores are responsible for retaining different aspects of sound.

Pictures of overtime memories encoded in outer cortical areas of brain (sound and words in temporal cortex in red in the figure ) and working memory in frontal lobes pulling out and selecting long term memories to guide current actions (red colour ) See Figure 1.

## Subsystems within the system of memory:-

All the subsystems work in close relation and are interactive and integrated. The declarative memories are those about which we can talk about and bring to mind consciously. But memory is more than that. We have a vast store of learned information that is not consciously learned and without which we would be lost forever.

**1 Episodic memory:-** Are replays of personal experiences of events especially of sounds and sights . Therefore the individual is the center of these memories. Personal memories of sounds and sights of each individual is person centered. They are unique to each person. They may unfold with time as if in a movie or may be like a sudden flashback.

In Music therapy when we assess the musical life panorama (**MLP**) of an individual we are starting with this type of memory. How episodic memory works? It though appearing as a mental act is reproducing a physical state that the person was in when the event occurred. That is , when a old man remembers a music which he loved in his teens the physical state of that age is being recreated in his brain cells . The same type of firing of neurons happen and the cell returns to a younger state. Thus the person gets invigorated as if in youth and feels healthy. The experience of the youth is relived in brain . But it is not a hallucination, but a remembering of a healthy past , a re-living of most cherished days of life giving same state of happiness which takes one away from the stress of life. The two hemispheres of brain are connected by a thick band called corpus callosum. This allows information sharing between left and right hemispheres. Episodic memories are suffused with emotions. Semantic memories do not have that emotional content. The episodic memory therefore requires more inputs from right hemisphere. (Which specialize in emotional aspects of perception). The role of right hemisphere in episodic memory enhancement is demonstrated , and people by hereditary reasons having more fibres in corpus callosum bring more right hemisphere information to bear on what they remembered. Since both hemispheres work together , people with more communication fibres remember emotional events better than they remember facts .

**2.Semantic memory:-** Is the Laying down and retrieving of facts . For example the fact that mangoes come from mango trees and coconut from coconut tree and New Delhi is in India and Kennedy was US President etc are memories for all alike and it has no personal episodic nature. The memory of me and you are alike in such facts.

The personal built-in encyclopedia of knowledge differ in individuals. Yet a person remembering a scientific or geographic fact need not be emotionally connected to it. You don't know how you learned or knew it. Somehow you have learned it and now you can state it as a fact . The same event is thus described as a fact as well as an experience emotionally connected (the language of a scientist and that

of a poet/artist) by the same person. The hook is usually in the language area of the brain , in the left hemisphere in majority of people . Language is the area where people hold factual information and semantic memory.

So the episodic and semantic memories , though treated as separate categories are very closely related . Semantic memory as core piece of information is left, when the context in which it is learned (the emotional personal side or episodic memory ) has faded away. Hippocampus is the area of semantic memory. Word storage is in the left hemisphere. Because it was first learned as an episodic memory , complete and perfect with emotional , sensory content and hippocampus is needed for firing up sensory areas in brain. While learning for the first time we are emotionally attached to the word Amma (mother) to all the sensations we associate with her but in adulthood it is extracted as a fact or a language term devoid of emotional relationships. (As a known word or collection of letters). An emotion thus becomes a fact . When we ask the person to remember the MLP ,/or when we play a tune that the person liked in his/her childhood , the hippocampus is springing back into action and recollecting all emotions that were associated with the first learning process. This helps in persons with severe memory loss, to rewind the memory and recollect the language and motor skill associated with it too.

**3.Working memory:-**Is the Capacity to hold information in one's mind long enough to work out what to do with it. For example keeping a telephone number long enough to dial it. Most of our day to day tasks are based on working memory which sorts out our thoughts , guides our actions, organize cognitive processes so that we can do several motor as well as sensory functions at the same time.

The brain have short term and long term plans to be executed. The memories of what has to be done at each level, how to do them, have to be kept warm until the act is accomplished. If we forget what a coffe-jar is and how to open it and what to do with it suddenly , you will hold it and gaze at it without any action. Sometimes this happens with old people. In day to day working schedules they forget what they are doing and how to do it . Working memory is situated in front of the brain and has 3 main components .

One is a tiny spot that holds the main plan in mind , the information needed for the rest of the brain to complete the task. We can call it the central executive. There are two neural loops that keep the main components of the plan conscious by repeating the pattern of activity that matches them. One of these holds **verbal** information and the other holds **visual** information. (**Sruthy** and **darsana** in Sanskrit). These are like scratchpads or black boards that can be wiped after doing the task , so that next task is done. If the item is very very important it is relayed to hippocampus for processing into proper memory. But if it is an information like pick up the coffee-cup, it is done and then it is simply thrown out and replaced by next command.

The scratchpads of working memory can hold between 5 to 7 items a time and in some experiments it was only 2 to 3. Very short term memory is related to intelligence. Like a computer with larger working

memory solve problems more quickly, people with greater brain capacity to hold images in brain are expected to have better reasoning power and problem solving skills.

Working memory lasts for 30 seconds only. The emotionally significant things are sent to hippocampus for processing as long term memory while emotionally boring things are sent out within 30 seconds .

**4.Procedural memory.**That which allow us to carry out actions everyday without having to think about it much, consciously. For example most of the motor functions like walking, swimming, bathing etc are procedural memories we do without much thoughts due to long term practice rather unconsciously.

The procedural memory is unconscious. The “how to “ knowledge that allows us to make physical movements, the acoustic knowledge of pitches and sounds are all learned in this way unconsciously . Learning to distinguish pitch and tone and sound starts in utero. And learning to walk , manipulate objects , feed themselves etc are learned while we are infants unconsciously. What we do as adults are mostly learned by us , as a race , unconsciously .That is, they are in the genes of the human race. It is a species memory. But each person has to practice them to perfect them.

But physical skills like typing a letter, driving a car, playing a piano are not in our genes and have to be learned with deliberation and with conscious efforts.

Procedural memories are created and stored in a different way from declarative memories. The raw materials (conscious perceptions) constructed along an assembly line of declarative memory. But that assembly line is only one of the many. A different assembly line carry information through another part of the brain , the parietal cortex where it is used unconsciously to guide our body to act appropriately. Seeing a cup, picking it up, making coffee, drinking it all are done by sensory and motor co-ordination of the procedural memories rather unconsciously .

There is a part called Putamen in brain which is connected by a complex bundle of nerves to pre-motor cortex, which instructs the body to move in a particular way. Procedural memories are in the putamen. When we undertake a new skill the conscious instructions are essential. When you first learn to make coffee or to hold a cup , when you learn to drive a car or pedal a tricycle these work . Learning a skill by repetition is happening .Then, once it is learned, it is left to the unconscious memories. So , procedural memories are learned as any other skills or kinds of memory by repetition and later become part of the unconscious memory pool. But whereas event memories are stored and retrieved by hippocampal action, procedural memories are stored in putamen.

**5.Implicit memory.**This too is unconscious. They affect our actions in subtle ways. Sometimes with no discernible reason we feel uncomfortable in some situations, or in someones presence or we feel happy in someones presence.

Nostalgia, sudden anger, or sudden fear – a strong emotion that influence our behaviour yet cannot be brought consciously to mind –are in the realm of implicit memories. Some of these may be relics of past events. Some may be aspects of past experiences which the person did not realize when it first occurred. The surge of neurotransmitters that occurred at the first event/experience and all neuronal

activity associated with it including processing is amplified suddenly. The original event is forgotten but this remnant of strong emotion that occurred at first sight or first hearing of a sound persists bringing about a implicit memory later on. Most of our likes and dislikes (love and hate) relationships with people are actually due to this. The deeply buried context-dependent memories are brought to surface as nostalgic love or fear or anger etc.

One example of implicit memory published by French physician Edouard Claparede (1911) was of a patient with amnesia. The patient never recollected his earlier visits. The doctor had a pin in his right hand when he visited the patient once and when they shook hands the pin might have hurt the patient . The next time the doctor visited, when they were trying to shake hands the patient did not wish to shake hands but he did not recognize the doctor since his amnesia was not cured. That shows the patient remembered the pinprick but not the doctor.

I will give another curious example of a case of trauma victim who lost consciousness and memory. He was a college student from Devagiri college, Calicut who met with a car accident..He was totally in amnesia and could not recognize his own father or sister .When the neurosurgeon visited the patient on the third day the boy started to speak of Shakespeare and his plays and Shakespeare's birthplace . Every body thought he was incoherently speaking . But the neurosurgeon said that he is regaining his power of memory and will be alright within a day. How did the neurosurgeon say that ? My husband Dr Udayabhenu explained it like this . This neurosurgeon was called Shakespeare Kumar during his college days due to his physical resemblance to the great poet. When the boy started to recite Shakespeare during his visit, the doctor recollected his college nickname and knew that the boy is able to memorise the picture of Shakespeare or image of Shakespeare from his memory and that had triggered his speech on Shakespeare so that the brain is on its right track of memory. Recognising a face from unconscious familiarity is known among experimental psychologists as the priming effect. The boy became normal within two days just as the neurosurgeon predicted..

Implicit memories need not affect long term behaviour.

If a person can hear a familiar and loved and emotionally important music and then recall all the positive memories associated with it , a string of such positive memories will by themselves start a self-healing process in music related activities of therapy.

How to build up a strong memory? Samuel Johnson said:-The true art of memory is the art of attention.

By attention or **Sradha** one enhance memory as well as learning .. But attention is an automatically captured rather than deliberately applied thing. Only if it is an interesting and catching attention thing we pay attention to it. Music is such a thing for entire human race . No other discipline can boast of such a universal attention from all alike. Music is emotionally related to our brain right from the time we are within the womb of our mother.

How can we correlate memories,emotions,and brain chemicals ?

Table 2.

Emotion	Brain chemical	Memory
Excitement	Acetylcholine ,noradrenaline	Vivid event memories /snapshot events
Pleasure /pain	Dopamine	Vivid event memories,snapshot events
Disgust	Glutamate	Associative memories like aversion to something or to somebody
Love and compassion	Oxytocin	Increases familiarity with loved object /person.Released during childbirth to bond mother and child.During sex to bond the couples.Inhibits the lay-down and recall of traumatic memories and thus make us forget and forgive our past sufferings
Fear ,envy ,hatred etc	Cortisol .Called the stress hormones .	Creates fear memories in amygdala and envy due to fear of the second person,hatred due to fear, anger due to enmity and fear of attack.Inhibiting the lay-down of non-fear memories by the hippocampus.

Thus different types of emotions and memories are linked with brain hormones. And a love or compassion generates oxytocin (the love hormone) while a stress hormone is produced by negative emotions and memories

## Part 2

### Age-related memory loss:-

We can have a perfect replay of our life only if we can find the stored files when we need it , in correct times. We forget a name on the tip of our tongue. The thing we want most from a supermarket shelf. The safe place we have kept a important document, or the car key or the salt bottle in the kitchen shelf. This sort of memory failures increase with age.

The younger people recall minute details of recent events, names etc .The older people are better in recalling external details which are having less details of recent event but general factual information which is extended knowledge about it .This is the wisdom of experience. In the history of human race the first hunter-gatherers and first cultivators had to remember and learn certain things. The youngsters had to learn how to thrust a spear, which tree to climb and how to pluck fruits , and how to plough a field , sow seeds etc. The youngsters of a seafaring tribe had to learn the spatial intelligence and vibration mechanics of the ocean quite early. The youngsters relied upon elders for knowing where the prey was most likely to be found, and in which season, and where certain fruits and leaves and trees are seen and in which part of year they grow best, the monsoon winds and its vibratory changes in ocean and the selection of seeds according to soil and climate and winds and seasons and position of stars during sea travel at night etc. That is on a wisdom based on previous years of experience, probably experience of generations of human races, which goes beyond the event of hunting, gathering fruits and making foodgrains itself.

The difference in memory is a general shift in the style of cognition. As the brain ages it shifts workload to distribute it evenly across both hemispheres of brain . It is just like using both hands to lift a heavy object rather than lift it with just one hand. This is a compensatory or balancing act for muscles of hands. Like that the use of both hemispheres is a balancing act .

#### **The tasks that older people find difficult:-**

- 1.Attending to a specific thing for example ; learning a new list of things without being distracted
- 2.Learning a new thing (But this is subjective. Several people do learn new things even in old age). I learned Photoshopper just a week back at age 64 .
- 3.Retrieving names and words on demand
- 4.Recalling details of past events clearly

**By way of compensation they are better than younger people in :-**

1. Making sense of new information by placing it in a meaningful context
2. Finding alternative words or phrases for a forgotten word
3. Using memories of a specific situation to draw general conclusions.

The elderly draw on both hemispheres to solve a problem while the young ones use only that specific area of brain suited for that task. Left hemisphere is best in perceiving and thus recalling details. Right hemisphere is best for looking at the whole situation .

When a person look at the figure below

D  
D  
D  
D  
D  
D  
D  
DDD DDDDDD

The left hemisphere is processing the D 's and the right hemisphere is processing the L shape.

If One person concentrates on the L shape and another on the D or the details the first is confined to right and the second to left hemisphere concentration . A balanced one concentrates in a wholistic way..The combined view of both hemispheres will make a complete perfect picture. The young and old people represent the two aspects and a combination of both makes up a perfect view of a nation and therefore both aged and younger individuals are needed for any nation for problem solving.



Can you remember any event before age of three? Majority do not remember anything before three years . So lack of memory is there even in younger people. The toddlers learn hundreds of new exciting things and words a day and all these have been forgotten by them in teenage , though it remains as a nostalgic emotion and surfaces again in old age . So old age is a second infancy. Autobiography is a memory which places an abstract version of ourselves within events that are recalled. Our past self is part of that memory and the feeling it gives of being there makes the autobiography distinct from a narrative of a story from a cinema or drama. Very young infants are good story tellers but they cannot create an autobiography because the brains have not matured sufficiently to form a necessary model of themselves. They do lay down events but they cannot recall it at will in an orderly way.

The older brains are becoming like that of an infant .The frontal lobes are susceptible to non – Alzheimer’s age-related degeneration and this makes the elderly less able to lay down new autobiographical memories. If proper mental exercise is there (just like muscular exercise) disuse atrophy does not happen to brain cells so that the loss of memory is not an inevitable thing. All people need not develop loss of memory in old age due to this reason.

The prefrontal cortex distinguish us from other mammals. It is the last part of brain to evolve in humans and last area to mature in an individual. It combines current perceptions with past memories to make judgements and decisions. In this process it creates a model of world in which it places oneself and thus guide our actions just like a road map for a journey. The right prefrontal cortex is more involved in producing an autobiographical smirithy which includes the sense of self. The left one contains memories that does not include the personal element. When we recognize an image of ourselves the right prefrontal cortex is activated. When we look at another face this part is not activated usually. (A differentiation or the mine , yours-I and You -exists). And when the right hemisphere see the self in all as the *Upanishads* and *Bh.Geetha* says , an integration and synthesis and a wisdom of oneness of entire creation happens. (*Advaita*).

When the hippocampus is injured by a stroke or any other reason the the navigation area of brain is lost and the ability to lay down new routés (of neuronal channels) is lost . But memories of places they knew years before, memories of music which they loved in their childhood etc may remain quite clear because they are in the cortex in the long term memory area. This fact is made use of when we get the MLP of a person from the relatives and we are trying to evoke such old memories and rewind the pools of memory.

ADHD or attention deficit hyperactivity disorder is a condition in which the brain’s natural impulse to scan the environment for information (flitting attention from one thing to another in quick succession) cannot be controlled. We control the roaming by *chithavritthinirodha* (as in *Yoga* terminology) and by this we concentrate on a particular subject and learn it thouroughly and then shift to next in our younger ages .In adult stage once we have mastered the attention process and concentration,we can shift attention from one to another as and when necessity comes. The best example I can give , from my own experience, is a Pathologist’s day to day activity.

An experienced pathologist shifts attention from one diagnostic material to another with perfect control. The first slide may be a lesion of the liver and the second a lesion of kidney and a third that of lymph node and fourth that of skin and so on. With perfect ease one shifts from one to another after giving proper attention to each and solving each problem. Another example is a performing musician who shifts from one difficult Raaga to another as easily and effortlessly during his/her stage programmes.

.People with ADHD cannot do this type of attention and concentration on a subject and then after solving a problem shift attention to the next with control. Their attention wanders from one to another without concentration on anything. 2 to 6 % people have a difficulty in remembering numbers alone and this is called dyscalculia , the numerical equivalent of dyslexia.

A small patch of cortical cells behind the ear, on fusiform gyrus of brain is called face area since this is activated by human faces. When this is lost the person fails to recognize even the dearest people (like daughter or son).

People who are tone deaf are not really deaf to tones . They just cant tell them apart. People who are colourblind just cant tell colours apart . Similarly a person who has lost function of face area do see faces but cannot tell them apart .

Total amnesia occur when all memories are wiped out.

**Retrograde amnesia:-**One cannot recall memories that occurred before amnesia.

**Anterograde amnesia:-** cannot remember incidents that happened after onset of amnesia.

Table 3:-

Type	Symptoms	Cause and outcome
Transient global amnesia	Sudden shortlasting memory loss  And confusion.30-60mts or upto 24 hrs.disoriented.has retrograde amnesia that extend back several yrs.	No cause identified.  Migraines,transient ischemia triggers this type.excellent prognosis.Recovers.
Dissociative amnesia(fugue)	Suddenly leave home .  Reach somewhere with no memory of last life.	Follows emotional trauma.Or a severe stress.It is psychogenic.No organic lesion.regain memory within

	Shortterm & working memory normal. this refers to traumatic memories believed to be repressed.	weeks. Some start a new life and return to past life.
Post-hypnotic amnesia	Suggestion by a hypnotist is forgotten. memory is not lost permanently. The suggestion that the telephone number will be forgotten, they dial it unconsciously.	It is probably similar to fugue. Probably a disassociation. reversible. lost memories recalled when rehypnotised.
Korsakoffs syndrome	Short term memory normal. severe problem recalling a simple story. lists of words. faces, complex patterns. confused episodic memory. accompanied by neurological problems. (uncoordinated movements and loss of feeling in fingers and toes)	Def of Thiamine (Vit Bi), alcohol abuse, dietary deficiency, prolonged vomiting, eating disorders, chemotherapy.  Treat with thiamine, nutrition and hydration. Slow memory function improvement and is usually incomplete.
Traumatic amnesia	Head injury, with concussion (temporary loss of consciousness). Loss of recall of events lasts for seconds/minutes. Sometimes to events that happened weeks before incident. during recovery remembers older things first, then the recent ones.	Gradual resolution. Sometimes memory of the trauma will not be recovered.

Post-traumatic stress disorder (PTSD) is a disorder when a person cannot forget the appalling traumatic experience. The symptoms are,

1. Nightmares
2. Flashbacks

- 3.Memory and concentration problems
- 4.Jitteriness and overreaction to ordinary events
- 5.Inappropriate fear and alertness constant anticipation of danger
- 6.Intrusive memories avoidance
- 7.Being startled at things that most people would ignore for example a rustle in the leaves.
- 8.Extravagant reaction to mildly perilous event for example a funfair ride is treated as a lifethreatening event.

Results of a new study provide strong evidence supporting a link between depressive symptoms and later risk for dementia and Alzheimer's disease (AD). The study, using data from the Framingham Heart Study original cohort, had more than 17 years of follow-up.

"We found that participants who were depressed had nearly a doubled increased risk of dementia over that follow-up period," lead study author Jane S. Saczynski, MD, from the Department of medicine and Meyers Primary Care Institute at the University of Massachusetts Medical School, Worcester, told Medscape Medical News.

Their report is one of several on the link between depression and dementia appearing in the July 6, 2010, issue of *Neurology*. Although the relationship between depression and dementia has been examined in a large body of literature to date, the results have been inconsistent, Dr. Saczynski said. "Basically there are 2 lines of thought on this," she explained. "The first is that depression is a risk factor for dementia, and the second is that depression is merely a consequence of the disease or a symptom of dementia."

One of the limitations of some of these previous investigations has been relatively short follow-up periods between assessment of depression and the diagnosis of dementia. With follow-up of 2 or 5 years in a disease like dementia with a long prodromal phase, it is still difficult to sort out the temporal relationship between the dementia and depression, she said. "Here we extend that and have a much longer follow-up period, up to 17 years," Dr. Saczynski said.

Participants in this study were 949 men and women from the Framingham original cohort, with a mean age at baseline of 79 years. Depressive symptoms were assessed in 1990 to 1994 using the 60-point Center for Epidemiologic Studies Depression Scale (CES-D). They used a cut point of 16 or higher, present in 32% of the group. She pointed out that this tool screened for high levels of depressive symptoms but not necessarily major depressive episodes.

During 17 years of follow-up, 164 participants developed dementia, of which 136 cases were AD. Of those who were depressed at baseline on the CES-D, 21.6% developed dementia vs 16.6% of those who were not depressed.

After adjustment for age, sex, education, homocysteine, and APOε4 status, those with depression at baseline had a more than 50% increased risk for dementia and AD compared with nondepressed participants.

Table 1. Risk for Dementia and AD With Depression (CES-D Score ≥16) vs No Depression

Outcome	Hazard Ratio (95% CI)	P Value
Dementia	1.72 (1.04 – 2.84)	.035
AD	1.76 (1.03 – 3.01)	.039

AD = Alzheimer's disease; CES-D = Center for Epidemiologic Studies Depression Scale; CI = confidence interval

Table 2. Risk for Dementia and AD With Each 10-Point Increase in CES-D Score

Outcome	Hazard Ratio (95% CI)	P Value
Dementia	1.46 (1.18 – 1.79)	< .001
AD	1.39 (1.11 – 1.75)	.005

AD = Alzheimer's disease; CES-D = Center for Epidemiologic Studies Depression Scale; CI = confidence interval

Results were similar when they included subjects taking antidepressants as part of the depressed group, they note. However, probably because the level of depression screened for in this study was relatively mild, not many patients were treated with antidepressants; for the same reason, they are not able to discern any effect treatment of depression may have on the long-term risk for dementia, Dr. Saczynski noted. The results were also unchanged when they excluded those with possible mild cognitive impairment (MCI).

The message here may be difficult for those already struggling with depression, and many patients have expressed this to her since release of these findings, Dr. Saczynski acknowledged. "But I think the flip side of that is that patients, families, and clinicians are very interested in identifying risk factors for dementia, and here we show a pretty early identifiable risk factor."

There are a number of behavioral and lifestyle factors that have been shown to be related to the risk for dementia, she noted, including sleep habits and exercise, a diet that controls cholesterol and blood pressure, and social interaction. "Of course it's kind of a double-edged sword — depressed people aren't exactly ready to go out and start exercising and engaging socially, but I think that's the clinical message here," she said.

### Consistent Inconsistency

Still, their findings are not entirely consistent even with the other articles published in this issue. In a separate study, researchers led by Robert S. Wilson, MD, from the Rush Alzheimer's Disease Center at Rush University Medical Center, Chicago, Illinois, used data from the Chicago Health and Aging Project to assess whether there is any change in depressive symptoms before and after the onset of dementia in AD.

They examined 2 subsets of patients. In 357 participants who developed incident AD during the study, self-reported depressive symptoms were assessed using the CES-D at 3 year intervals for 8 to 9 years. A second group of 340 agreed to annual data collection using an informant report of depressive symptoms on the Hamilton Depression Rating Scale for a mean of 3 years after a diagnosis of AD, MCI, or no cognitive impairment.

The incident AD group reported an increase of only 0.04 depressive symptom per year during the 6 to 7 years before diagnosis and no change for 2 to 3 years after diagnosis except for a slight decrease in positive affect, the study authors write. In the annual follow-up group, neither AD or MCI were associated with change in depressive symptoms during 3 years of observation.

"There was a barely perceptible increase in symptoms before the diagnosis and even less change after it, with comparable results in African American and white subjects," they conclude. "The findings suggest that AD has little systematic effect on depressive symptoms."

However, researchers led by Vonetta M. Dotson, PhD, at the University of Florida, Gainesville, found evidence to support the idea that depression is a risk factor for dementia, with recurrent depression being "particularly pernicious."

The study authors used data from the Baltimore Longitudinal Study of Aging on 1239 older adults who were followed up for a median of 24.7 years. They were looking at the question of whether there was a dose-dependent relationship between the number of episodes of elevated depressive symptoms and the risk for subsequent MCI and dementia. Like the Framingham group, they used a CES-D score of 16 or higher to define elevated depressive symptoms.

They report a monotonic increase in risk for all-cause dementia and AD as a function of the number of elevated depressive symptoms, with each episode associated with 14% increase in the risk for all-cause dementia. Having 1 symptom conferred an 87% to 92% increase in dementia risk, and having 2 or more

symptoms almost doubled the risk, they note. However, recurrence of elevated depressive symptoms did not appear to increase the risk for MCI.

"Preventing the recurrence of depression in older adults may prevent or delay the onset of dementia," the study authors conclude.

#### More on Mechanism

In an editorial accompanying the publications, Yonas E. Geda, MD, from the College of Medicine, Mayo Clinic, Rochester, Minnesota, points out that all 3 studies have 2 important common denominators: all are prospective cohort studies that used the CES-D to measure depression.

"The prospective design means that it is possible to identify the presumed cause of cognitive impairment (i.e. depression) before the appearance of the effect (i.e. incident Alzheimer's disease or MCI)," Dr. Geda writes. "The use of a common measuring tool means all the 'blessings and curses' of the instrument are equally applicable in all 3 studies."

He outlines 4 hypotheses that might link the 2 conditions, including direct causation of dementia by depression through glucocorticoid or vascular pathways, or reverse causality, where depression is an emotional response to evolving cognitive impairment. The confounding hypothesis posits Alzheimer's pathology may cause both dementia and depression, or finally there may be a synergistic interaction between depression and some biologic factor that leads to dementia or MCI.

"The association between late-life depression and cognitive impairment does not appear to be spurious," Dr. Geda concludes. "However, there is insufficient evidence at present to support the hypothesis that depression has a direct causal relationship with subsequent dementia.

"Only a future mechanism of disease study with a biologic marker for depression can clearly identify which of the 4 hypotheses is most pertinent in explaining the link between depression and dementia/MCI."

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This is significant since Depression (*Vishadaroga*) and negative emotions can be controlled, prevented and reduced to a great extent by effective music therapy and by communication skills developed between family members and the therapists/counselors .

**Which is the brains best witness of truth or lie –detector /Is it darsna or sruthy?Is it the visual cortex or the auditory regions?**

Indian sages were very accurate when they said **sruthy** as best for any pramaana of doubtful cases. Now, the Harward university researchers of Massachussets have found that auditory regions of brain are more accurate and active during accurate recognition than the visual cortex which sometimes gave mistaken or inaccurate results . Although a mind in conscious or jagrad state make mistakes about what is seen, the unconscious areas that actually sensed the original are not fooled.

**Jamais vu** is a condition opposite to **Déjà vu** . Here instead of being familiar with a totally strange one, person feels unfamiliar in most familiar surrounding and fail to recognize own kith and kin. Not even a daughter , son , or husband or wife with whom they have spent entire life .

All these things a music therapist will come across when they start practicing with real life situations. It is not just singing for an elite group of rasikas alone. It is working with people who suffer from various conditions and help in a most efficient and possible way to reduce their suffering.

Table 4.Age associated memory impairment (AAMI) and Alzheimer’s disease.

Activity	AAMI	Alzheimers disease
Rate of onset	Gradual over decades with long periods of stability	Sudden .Precipitous decline within months
Memory	Forgets some experiences or parts of them.Sometimes recalls later.retain memory of very familiar places and people	Whole periods of life forgotten .Once lost these rarely return.Gets lost on routes and places that are familiar.Do not find way to home.Fails to recognize family,friends
General intelligence	Able to follow plans of action or instructions though lose thread and need prompting.Able to use memory aids such as written	Gradually lose ability to follow written and spoken word or to follow a plan of action



	notes.recall of information retarded ,But arrive at answer through indirect routes	
Language	unaffected	Increasing difficulty in self expression.May talk in a rambling ,incoherent manner
Selfcare	Capable	Gradually becoming incapable
Mood	Unchanged except for personal irritation due to own condition	Unstable.swing from depression to euphoria for no obvious reason
Social behaviour	Socially competent	Behaves increasingly inappropriately

Naama and roopa of a person /object /world and its linking for knowledge:-

The naama and roopa is the prapancha or world. And the linking of the two happens best when we are in **sushupthy** when the knowledge or *gnaana* is given as a *darsana* or internal perception akin to a **Samadhi vision** . This is the most ancient teaching of India. How does we compare this with modern scientific view?

1.During **waking state (jagrad)** the name Suvarna and a face of me is registered . This is fed to association area in your brain and to hippocampus. Acetylcholine is high during waking which prevents hippocampus from feeding signals back to cortex. So information is not merged or distorted with other incoming stimuli. Instead they link together and are locked or encoded in hippocampus.

2.During **sushupthy (dreamless sleep)** Acetyl choline falls and this allow the newly encoded memory to be fed to association cortex. There is no information coming frm outside to cortex. (due to a blockade of all sensory organs in sleep similar to chithavrithinirodha in yoga). The feedback from hippocampus therefore re-triggers neural patterns that were activated during previous waking . Including the sight of my face and its neural pattern corresponding to name suvarna. As these two cortical patterns fire in unison they become linked and the neuronal linkage forges a new connection between the concepts such that if one (the form or face) is triggered , the other (the name) is likely to fire up too. Thus the name and form is consolidated. In the same way a word and its meaning become consolidated (*Vaak* and its *artha*) during *sushupthy /Samadhi*. Thus *Naamaroopaathmaka prapancha* is consolidated in *sushupthy/Samadhi* state by human brain .

### Keys for a good memory:-

1. Interest, attention and emotional and personal involvement .

The wider the interests of a person, the more actively one engages with such interests, the denser and richer will be one's memory network in brain. Thus new information is likely to find a place to lodge in your brain even in old age.

2. ordering our experiences

Experience is doubled by thinking about them. When we make a mental note of a (musical) experience we want to keep (in our brain network/or a notebook for later use) it will focus our attention, organize the information into a form that will make it easy to access later . This enhances memory

3. Repetition and rehearsal:-

Everytime we recall something , we are fixing it more firmly in our memory. For this the best method is to think of what we want to remember always at the beginning of the day and end of day (The two sandhya ) . Japa is a repetition . In olden times students were doing along with *sandhyavandhan*, repetition of *Gunakoshta* (multiplication tables) and other things to be learned like seasons, weeks, months etc.

4. Learn often, but little by little, step by step.

Give time for brain to assimilate and process new information. Several short sessions, punctuated by periods of review is best for this. By this we are not cramming the brain.

5. Keep socially, intellectually, mentally and physically in touch with likeminded , good people (*Sajjana samgha*) called *Sathsangha*. Avoid contact with people who distract mind and intellect.

6. create memory games from every day experiences itself.

One can remember street names or district names or city names as we travel from one place to another. My father used to encourage this as we traveled by car from Punneyurkulam to Thiruvananthapuram or to Calicut.

Another game which children can do while traveling is to add the numbers on numberplates of vehicles that pass by and quickly decide which is odd and which is even .This will increase our number sense. I used to do this even after my marriage and my husband used to make fun of me for this pastime.

A jigsaw puzzle or a *Gnan choupad (Leela )* a *chathuranga* etc were used in ancient times to increase ones attention and problem solving ability. The scrabbles is for increasing vocabulary of children.

### **Some external aids:-**

1 Reminder notes.

List of grocery items for shopping, organization and flow charts for office use, list of things to be done in a special date /week/month/year and so on . Look at them regularly.

Lecture notes and discussion notes of teachers

2.Visualise the colours, forms , locations in mind when one visits a place or when one has a special musical experience etc . This will be more useful for making a memory connection and recall than a note prepared as a list.

3.An alarm clock or timer. Mobile phone alarms to remind something.

4.Wall planners and electronic organizers

5.Alarm device on keys, purse which you are likely to forget .

6.Labels on cupboards, drawers and on kitchen jars

7.A pill organizer for medication

8.Keep a journal. This is a hobby as well. This help you organize your entire life.

9.Pocket cassette recorder

10.A camera

11.Suppose you have found something very interesting in a new location and you want to measure it .You don't have a measuring device . The best measuring device is your own hand and feet , fingers etc. This is not an external aid but is a very valuable aid which you can carry anywhere and everywhere you go.

### **When to use an external database?**

When you don't want to clog brain with lot of information which you can store somewhere else. A library is such a storehouse.

A telephone directory

An appointment list made long time in advance

Report of an event

To present a bulletin within a short prescribed time limit on radio or TV or in a speech

A lecture class . The points to make it more sensible

When no time for a rehearsal or repetition, when you are busy , you can rely upon the note .

One important aspect for remembering things is by the puns which are abundant in all Indian languages as the **literature and music** suggests. the examples are voluminous and cannot be cited here. The modern use of **Onomatopoeia and Mnemonics** are used by such ancient authors.

Here I will consider Mnemonics.

When a medical student is taught the preliminaries of clinical medicine he/she is taught (for treatment of fainting):-

If face is red , raise head

If face is pale , raise tail.

(This depends upon the blood flow to head ). The **rhythm and rhyme** in this help student to remember the treatment . This technique was used in all sciences of India (**Ayurveda, Jyothisha which show lot of rhyming verses and rhythmic poetry easy to memorise and keep in brain in a oral culture** ). Rhythm and rhyme help **storage in both hemispheres when combined with language**. So **music with a vocal literature** has this property. **When we recall rhythm or tune , the words/sahitya /language also pop out of it and vice versa stimulating the two hemispheres simultaneously to function in unison.**

When we remember our **Teacher /Guru , and the voice of the Guru** ,accompanied by the melody , rhythm, rhyme and emotions that evoked within us, when we first heard him/her , we are visualizing our first experience with the music and reliving it and recreating the same emotion in us after several years . **The voice of mother, her lullaby**, her love, care, face and even the smell of her dress come back to an adult when he/she visualizes such an emotional musical experience. It is the same with the musical experience with the Guru. **The feeling of ecstasy, security and peace thus recreated from a sound and**

**visualized and experienced again and again become fixed in our memory** . That is how the musical life panorama works .

**Creating a link:-** Before the printing press and recording devices, only oral teaching/instructions were there. This could be achieved only with Mnemonics and visualization of musical lessons/rhyming sloka or sahitya. Brain retain and recall by creating links of language and for this Puns was used. Another very interesting practice was to give a letter a number which was widely used in Astronomy and music of India. Now we use such a device for computer language . So the originator of the binary system as well as **attributing number to letter** , both started in human computer brain millennia before the modern devices evolved.

Some methods of using mnemonics:- If you can remember SARCASM you can remember the list of mnemonics techniques .(The first letter of each )

### **1Sentences/Acrostics;-**

To remember the order of the treble clef **EGBDF** a sentence

**Every Good Boy Deserves Favour** .

### **2.Rhymes and songs .**

Rhymes, rhythms, melody and repetitions of it aid memory . Therefore music enhance memory. Word in left hemisphere (*sahitya*) and melody in right hemisphere (*sangheetha*) a combination is achieved with vocal music using both *sangheetha* and *sahitya*. Linking these two effectively so that information spreads equally throughout brain in a balanced way .This technique was a *vinoda* (*leela* or play/fun ) for learned and creative people of India. But it was also a technique to keep cognition, intellect, memory and traditional knowledge intact through generations of mankind..The rhyme of the song draw auditory memory so that tunes, songs and poems are learned easily (*Sruthy*).Thus through that sciences and languages are interlinked .

Mnemonics of modern pilots to temperature and pressure drops at low and high altitude is comparable to that of medical students learning technique mentioned above.

High to low ; Look out below.

Low to high; Clear blue sky.

A weather tip:-

Rainbow in morning-Travellers warning

Rainbow at night-Travellers delight.

(Rainbow indicate humid air. In the west in morning a rainbow indicate storm which come from west . In the evening in east it indicate the storm is over and weather is good.)

**3.Chunking** is for remembering large numbers. One can remember upto 5-7 things at a time. Suppose there is a large number .

044 45500078

It is easy to remember this telephone number by splitting it into three chunks like

44455000 78 .This is my phone number and this is how I remember it .

Suppose it is 64831996

One can split it as 4 easy to remember chunks as

64 83 19 96

Or as three chunks

64 83 1996

Now adding and finding out even or odd is also easy . It is done as a mental exercise quickly.

#### **4.Method of Loci:-**

The way in which ancient bards and speakers/orators remembered their music/epics/speeches/commentaries etc. This combines use of organization , visual memory or visualization and association and hence is a complex procedure achieved by human brain.

I will give an exercise here for all readers. This is done in music therapy visualization procedures .

1.First ask your friend to sing two lines from a poem/song at a slow steady pace , say one word per second. Concentrate on the words alone and remember.

How many words you can remember just by hearing once?

2.Think of a vast location. Or distance mapped in your memory. Visualise each river, mountain, greenery, each gurgling stream in the landscape. Then listen to the same lines again connecting each

word with the landscape scenery one has visualized in order.( A *krama* or orderly arrangement of words ). Now the traveler know the visual imagery landscape as well as the location of each on the song. This is how the epics of India are constructed. Almost similar process is used by Australian aborigines in mapping the long and distant landscapes and geographical places. The Indian epics give landscapes of entire cosmos, of the globe earth and of Indian subcontinent in detail associating each with seasons, plant and animal varieties, fragrances, spices and human nature and customs etc .

The Indian music also has the same technique of relating each raaga with season, time of year and day, of a star, and a *graham*, to days of week and to human organs and panchabhootha, including living and nonliving objects like jewels etc. If one can know ones birthstar, the animal, plant and graham associated with it, the raaga associated with that star, and with each season, and with the organ of ones body affected by some illness etc , one can use an assortment of Raaga suited for each for a perfect understanding of the problem and for solution of problem. Thus the method of loci is applied in *Raagachikitsa*.

**5.Acronym** :-I had left out the A which is used twice in SARCASM .This is the most common abbreviation that we now use.

Example :- RSPCA is Royal society for prevention of cruelty to animals.

In ancient India *Panchadasi* was called *Lopamudrasuthra* (after name of wife of Agastya Rishi). This is a magical square (in which Srinivasa Ramanujan was expert) and this was called LOSu or Losoo( the first letters of Lopamudra and soothra). This was known to China from ancient period in this short or abbreviated form itself showing its origin. (from India).

Another example is Hora. People think that it is an adaptation of the Greek word Hour. But it is not so. It is an abbreviation of the word **Ahorathra**. The first letter A and the last letter thra are removed and the middle word is used in order and in reverse order to create two words . One is Hora(or 15 degree) and the other is Raho or Rahu the node which creates the division of time which is indivisible. It is more likely that hour was derived from Hora , an acronym practice in India.

The way of remembering parts of leg by a zoology student of modern times is :-

**Cockroaches Travel Fast Towards Their Children**

Coxa,Trochanter,Femur,Tibia,tarsus,claw . That make up an insect's legs.

So both ancient and modern man alike use such techniques in learning and our brain has not changed much in the capacity of cognition and memory. And it is possible for one to learn by ancient methods and with music of ancient India which is riddled with puns and *praasa* and rhymes, rhythms, repetition of *sangheetha* and *saahitya* alike to stimulate all parts of brain and nervous field of all living organisms. It is needed for balancing of our health and mind and body as well as intellect and spiritual development to be a perfect individual.

Feeding our brain adequately:- A nutritious food rich in cereals , fruits, vegetables, nuts (and if necessary and absolutely unavoidable a little bit of nonvegetarian food ) and milk, yoghurt etc and less of fats, oils is needed to keep memory according to modern standards. But the use of butter and ghee in infancy and childhood is essential for brain formation and hence in infant diet, milk and milk products is a very important factor. Mother's milk is essential for any infant of mammalian origin.

Can an adult brain grow and have new knowledge storage or memory ? Yes . How ? By synapse formation and synapse plasticity which cause structural and functional correlates of memory , learning ability and intelligence is the answer of new neurobiology. (Sara Mariani conference report :The biology of memory and learning .Highlights from the annual meeting of the American society of Cell Biology Dec 13-17 ,2003 San Francisco California .Medscape Molecular medicine 6(1 ) ,2004). By repeated stimuli (repetition ) and by experience there is new protein and synaptic synthesis and the remodeling due to experience-dependent plasticity (EDP) leads to long term memory formation has been proved . So *japa* , and repetition of the same learning for a period of time (practice) can lead to memory storage for longer periods. And the perpetuation of memory of tradition and culture is based on individual as well as archetypal memory of entire human race . Music and musical memory of India is here utilized for the purpose of improving memory in normal and compromised children for development and in people who have lost memory (amnesia) for retrieval of memory on such principles.

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## Chapter 12

### EVIDENCE BASED GUIDELINES FOR CARE WITH MUSIC THERAPY IN CSHCN

First formulate basic guidelines and then implement them .

1. The small circle of improvement model:- Plan—Do—study and analyse the effects subjectively and objectively—and then act and improve on the model.

2. Longitudinal continuity of care.

Requires long time follow up and contact with child and family. Therapist must be available for long term consultation. (either in person/or by email/phone etc)

3. The orderly transfer of care from expert therapist to the assistant can take place gradually when the assistant gets confidence to deal with the problem.

4. It should be family centered care.

Role of doctor/clinician/therapist is at two levels

1. Care of individual child and at family level

2. Development of systems of care at community/population level

### THE BASIC PLAN

- 1.The first and the most basic is the proper evaluation of the child and diagnosis by the PCP/Paediatrician and then involvement of a team of specialists
- 2.The therapist is a member of the multidisciplinary team . Should be able to communicate and work in unison with them.
- 3.Verbal and written communication between the team members is facilitated by a diary in which each member notes down the observations at each visit and this is kept with the child/parent and sent to school/to therapists/specialists so that each is aware of the progress and condition of the child and what he/she is getting as intervention.

After having a pretest knowledge of the condition of child from teacher/parent/doctor the therapist can plan the strategy. (The pretest here means the condition before music therapy started )

- 4.From assessment of the pretest condition provided by the team, the therapist has to group the clients and then do group and individual assessment of the clients

- 5.Grouping :-Can be done in different ways according to the combined decision of the team.

The different varieties of groupings are in order of preference

A.Infant-toddler groups, preschool group, school age, and latency/adolescence group

B.On a basis of class .as given by the present team.at Adarsh School Ernakulam)

C.verbal-nonverbal (which is not very good procedure)

- 6.The groups of children with the parents attend the group sessions.

The methods are variable for each group depending upon its requirements as well as for each child. But in the initial 15 days the groups are given a test model.

Have a *sruthipetty/Thamburu*/or even a keyboard with you and to its *sruthy* just repeat *sa pa a saa /mandra shadja* with *athitaara shadja*/or *mandrashadja* with G3 or N3 as in *Panthuvaraali /Rasikapriya* etc. Just the swara only with *sruthy*.

The two notes used should be at recognizable distances . This is especially of use to test the children without language or with monosyllables alone who will try to make sound as the pitch we used . This need not be perfect. But let them be free to make whatever sounds they please . The turntaking, the pitch , etc and the time taken for each child can be noted down in diary. Some children take more time , even days. Sometimes they just keep quiet for three or four days and start making cooing/babbling noises after 4<sup>th</sup> or 5<sup>th</sup> day, indicating that they had been attentive/listening/learning (cognition/memory improvement).

In the initial period children may not tolerate more than 30-45 minutes of this. Some may tolerate more time. These variations have to be noted and remembered by teacher and parent. Initially if the child sits for 20-30 mts it is enough. Later when he/she becomes interested in music they sit more. The creating of interest in music is the art and efficiency of the therapist/parent teamwork. To which teachers can contribute a lot.

At home parents can casually start singing the same notes if they can sing. And see whether the child respond by any making of sounds. Better still is a recorded sound of music therapist to which played at home the family /and the siblings sing in pitch. That might be a stimulation for the child to make sounds.

When selfconfidence come they will start in groups also.

For those already having singing skills low frequency raagaas are selected and the familiar music sources used first. Better to use only vocal so that there is no attention problem from background noises of BGM. Because the autism spectrum is a disorder of sense organ functions the distractions may be too much for them to concentrate on one thing.

About the pretest EEG and fMRI :-

This is for research and for community programme (for further care of the future children who may be affected with the same disorder) and does not have much role or rather limited role in individual childcare. The fear the hospital/equipment/conditions of the research can create and stimulate the amygdale can be of negative influence to the music effects on individual child. Most of the available data are on volunteers and parents of children with autism who volunteered . And the family and the autistic children were known to the researcher for long time so that the fear complex was minimized.

So, if these are planned we can do it this way. This is a suggestion which we can discuss in detail, in case the parents are willing . (If not, this should not and cannot be done)

1. Do pretest assessment before the sessions of music therapy starts and have a baseline value ..

2. In those children who have shown definite improvement and who can tolerate external fear situations , we can do a posttest after three months of intensive therapy and compare pre and post tests

3. In the intermediate group of responders we can do the posttest after 6 months of intensive therapy and in late responders one year after the intensive therapy.

4. If possible restrict this only to children who have passed the adolescent stage and not on toddlers and young children .

5. Make sure the client you select can withstand the procedure for the required period of time and will not be frightened or made worse by the procedure because there is disordered sensory function in these children. Explain the entire procedure to the parent/caregiver /teacher before launching on the project and only with their consent and co-operation do the research.

6. Whereas the music therapy is a very safe procedure without any side effects, the neurological research programmes could be stimulating the amygdale and cause fear complex and therefore the entire time or duration needed for the test , its implications etc must be informed (Informed consent) to parents in detail.

Thus we have one pretest and posttest value for all children but at different intervals depending upon the response.

This is a broad outline of strategy which we have to finalise.

The principles are

1. Acknowledge each child as a unique person and valuable

2. Inform, empower , communicate with parents/caregivers and across the care continue to the community health programmes

3. Participate as fully as possible in the child's care

4. This is a nonjudgemental family centered casemanaged care programme .

5. How to participate and advocate? By having close communication with children and parents and teachers., By making systematic models for management, Pushing the policy and programme changes in support of high quality care , continue to remodel according to needs of the child as he/she grows

The dimensions of quality care are

Safe	Free from negligence and does not cause harm to patient or community
Effective	Overuse of ineffective care and underuse of effective care should be avoided. In the case of music it is underuse of an effective tool. This effective tool to be used matching to scientific principles and improving community health
Client centered	Honouring each person and respecting the choice of the client and family
Timely	Should not delay the process of growth
Efficient	Reduce waste of energy and time by systematic plan and management in advance by careful study /research /plans
Equitable	No racial ,class,sex ,wealth inequalities in health care by music therapy..All alike in God's eye and in nature's eye and in healthcare professional system.

Policy decisions:

- 1.Evidencebased practice .The explicit use of the best evidence to inform decisions about the care of individual patient.
- 2.Quality measurement and improvement .
- 3.costeffectiveness of the programme
- 4.Public release of quality information
- 5.interoperability that links clinical, public health , school, and family data of children with developmental delay through medium of music
- 6.standardisation of data by a team of experts –team work .

## 7. Translating research into practice

These are the broad outlines on which I have worked out the programme.

A case history:- Boy born in 1999. Mother is a Tamil Brahmin girl trained both in Karnatic and Hindustani music. Father a Gujarati gentleman. The boy has severe CP with motor deficiency. The family contacted me in 2005/6. The child was getting symphony orchestra from the special school from his music teacher which showed no improvement. The mother noticed that the boy is attentive when she sings melodies at home and she wanted to know whether I can suggest any Raaga for the boy, based on his Nakshathra Mrigasira. I asked her to try with simple Raagas and continue with whatever he likes and responds because what we need is some type of a response. She, along with her little daughter, started singing swaras and melodies to the boy. In 2009 she reported to me that the boy is responding very well to the simple Swaras of Mayamalavagoula ( 15<sup>th</sup> Melakartha) and when the Tharaswara Sa and Ni are sung he makes the most responses.

The best part is that, the music teacher in the special school, seeing the boy's improvement has asked the mother to help with other children in the school and she has started to do social help and is feeling a satisfaction that she could be of use to hundreds of children through her son.

Thus music therapy has actually become a social activity for the mother and her stress is relieved to a considerable extent.

One of the students from the first batch of students from Pankajakasthuri Ayurveda college who conducted a certification course in Thiruvananthapuram was doing a similar trial with Panthuvrali Raaga, in an institution at Kottarakkara, and he told me that he is having 68 % success within fifteen days. That was over the phone and the project is not documented or reported. What happened to the project after that is therefore unknown.

This lack of documentation and the lack of proper follow up is the problem which we have to address effectively by proper guidelines regarding projects and their documentation and the importance of projects in development of the discipline. Music therapy is a new discipline as far as Modern India is concerned and lack of proper documentation and guidelines and haphazard way of practicing the discipline has to be checked by University and Hospital-oriented projects as teamwork of musicians/doctors/paramedical staff /and administrators and these collected data published for the use

of all the future researchers and students and the public .The series of books I write are for giving such an awareness ,for benefit of society .

### *Play drama continuum as learning sequences in development of children*

Every child grow through imitation of what they see and hear from their elders.For them this imitation and learning is like a rehearsal in the drama of life.All of us have learned Turn-taking through the drama of listening to,watching and eye-conatct with our elders.Because this is the most natural way of learning for all human beings.The child observes others engaged in their duties, conversations as if watching a play.They are attracted by the emotional responses of the elders.They share the affective moments with others and creates them naturally and by these learns to tolerate others,or to be cross with others .

How can we assess the schedule of play Activity in our children as parents and teachers?

#### 1.Free play observation:-

Give a vegetable/fruit/a toy /or a chocolate (something safe for the baby only) .For five minutes watchteh baby.What does the baby do with the object?

Is he throwing it,chewing it or playing with it or not paying any interest at all?

Is your child able to arrange the toys in a pattern when he/she grows up?Like a doll for bathing,to putto sleep or to give food to it?

trying to drive a car with a noise simulating a running car?Making a shed for the car? Or a bed or cot for the doll to sleep?

#### 2.Structured play assessment:-

The teacher/parent hides a toy and then shows it saying “I have seen it” a sort of hide and seek .Watching the interest of the student/child in the play this has to be done.

Make a dollhouse ,car garage,or drive a car with saying what you are doing (as a narrative) and see whether the child watches and listebts.

Does he/she repeat it?

Does she/he bring in a new idea into the play ?

These activities are actually assessing five types of activities as below

Expansion:-The relational aspects

Modeled routine:-which is functional aspect

Narrative:-which is using symbols like language and hence symbolic

Flexible narrative :-which allows changes/innovations in the narrative

Interactive:-which is a meaningful communication between child and teacher/parent

From these come the accommodation and the Thematic fantasy and from there the interaction is very creative for the child and is a spontaneous reaction as learning .

The role of Musical drama in which animals in play situations (as in Panchathanthra ) helps learning as a narrative and interactive spontaneous fantasy and creativity .Similarly we can do musical drama with any other object –vegetables,fruits,human ,birds and even pots and household articles.By this the child is learning spontaneously language,music and interaction through a play which he/she enjoys.

#### Selection of topic:-

What topic we select and how we present it so that it attracts attention of child is important.The stimulus to attract the child can be a picture,an object,a letter/alphabet,a story or a familiar music .

Starting point:-

- 1.who are the children to be addressed .Their age group previous learning etc
- 2.who am I (teacher/parent)
- 3.When and what we are doing

The strategy :-

Create a make-belief/fantasy

Resolution

Possible developments (open lesson plan)



Focus on the child.Slow down.Do not rush .

For musical plays we can use musical instruments in which some children will be interested.This we can find out from the way they are shaking,tapping,blowing,scraping,clapping and making rhythmic sounds vocally.It is always better to use nondigital simple instruments instead of electronic ones because the natural or near natural sounds of the simple instruments will do good to the sensational abilities,to creativity etc of the child .

We can also have a collection of good vocal music and different types of childrens songs and videos in the school for showing the children so that they are exposed to the music of different types.

When we are doing a musical play use minimum speech and maximum music but when we share the experiences in each musical play,make use of maximum speech and minimum music.By this both language and music are improved.At times prompting at critical moments may be necessary for some children.

Teacher/parent can imitate the child's voice .Small children listen more when the children's voice is heard .But after getting their attention,slowly switch on to our own normal sound so that they know your real voice.

Music is rhythmical speech with pattern of intonation.We can teach children best through musical media.

A musical game:-

Children sit around a tree in the schoolground.The first child is having a hat on his /her head.The teacher sings a few lines .When the song stops the child has to put the hat in her/his neighbour's head.The object need not always be a hat.It could be a ball or something else in the hands of the children.But every time the song ends and the next song begins the object has to be exchanged.The children are encouraged to sing .Either the same song by all (as in musical chair) but better to allow them to sing their preferred song so that the song as well as the object changes as the days proceed.

Observe how the children enjoy the music as well as the play.

How they learn turntaking through music and exchange of an article.

Which object and which song each child love best

And which of the children are naturally inclined to musicality

Small group teaching:-

Group stories,group singing sessions ,sharing of experiences and improvisations

### Gardening and music:-

Nature and music has several things in common.Hence music in a natural setting is always having self-healing properties.Encourage children to enjoy music and nature.Allow them to plant herbs and trees ,water them ,and sing to the plants .Plants love music and grow better in musical environments.Just as humans plants too love music.

This awareness will make children love nature as themselves.All birds and animals and entire world as themselves and this gives an inner peace to children as well as adults .

Homebased and schoolbased evaluations are done by parents and teachers in the same way .

Indian music developed in the natural settings like rituals ,with farming,harvesting,forests etc have all these natural rhythms of Indian seasons and is best suited for Indian geographical features and has to be used for positive effects on our children and adults for a cultural as well as geographic identity of heritage .Music and arts and scriptures are the heritage of a nation which is for entire humanity and which gives an identity to the people.It should be given proper place in every activity,in curriculum,in health and problem-solving,in personality development and in feeling the oneness of entire creation.

This is for normal children.The same can be used for the children with special needs who require special attention too. Music Therapy is Result oriented,client oriented community oriented approach and is integrated medicine.

The Curriculum Interactive research in Autism UK (CIRA –UK) known as Keera has been trying to define research in autistic children also along these lines .Among their research methods shadowing a child a full day (Watson 1989),Videotaping a child for 10 minutes/child in a school,and interviews with teachers and speech therapists are included.And their assessment tools (Weatherby and Prizant 1989) is being experimented

Each and every one of us has a unique voiceprint.In Indian languages the swara is the life and vyanjana is the body and the vedanga skiksha is to train the pronouncition .The swara is prolonged (dheergha)and the last vyanjana is stressed and pronounced correctly by all mothers to communicate emotions and for teaching their child the mother toungue.

Repeat this for several times.And do it slowly so that it goes to the childs brain and stays in memory.

### The sonorous envelope as audiophonic skin ,bone-The first psychic experience.

18 weeks infant recognize 16 voice changes in mother. This is in 360 degree. From 14<sup>th</sup> week the child responds to sound. In 28 weeks special response. In mechanical respirator ,recorded voice of mother as saanthwana lullaby will quieten the child. The speech has not developed in utero. But the recognition of sound, pitch, tone variations emotional content of mothers voice is recognized. It touches ,feels and hears through entire body the sounds of mother only ,her voice, heart beats, breath sounds. Experience with entire body.

*Sruthi* is first recognized .The *smrithi* of it forever gives the feel of language.

If mother talks in 35-40 decibel to the child in utero, or if she sings in 20 decibels the child is quiet and her heartbeat is normalized. If at 75-80 decibels some degree of disturbances .Not calm. More than 80-85 is not good for the child.

3 day old infant recognize mothers voice from other females of the household. she doesn't recognize her face first but her sound. First week she distinguishes between human voice and a kilukku. Two weeks all female voices. 3<sup>rd</sup> week gives a smile to communicate that I have recognized you. 5<sup>th</sup> week even if it is drinking milk and is hungry ,if you talk to her, she stops drinking for a mt and gives you a milky smile and then resumes drinking. The social consciousness and communication has started to develop. When it hears a human voice making songs or a melodious tone it will try to imitate and makes "comfort sounds" These are in same tune, same sruthy.

Is this only for human? Mammals (whale, dolphin, bats) understand normal natural sounds. Parrots and mynah imitates and sing. Glutamate receptors in brain are same as humans. In 56 species:- frequency codes studied .low pitch harsh voice more confident ruling class. High pitch soft –the less confident ruled ones. Children and women have that. The human infant as it is born has all the ranges of recognition in its brain like an adult but cannot produce all the ranges due to the position of larynx (nearer to pharynx) by 2-4 yrs the larynx descend to its normal position and the root of tongue also and by that time he can produce all the ranges like an adult. Therefore by 3 yrs we put the child to ceremony of initiation to writing and then by 5 yrs to a teacher to give proper shiksha of language pronunciation, music and other arts .

Adult chimpanzee and newborn child position of larynx and tongue alike but in chimp it remains same. Homoeructus (7 lakhs yrs ) homosapieens cromagnon (3 lakhs) Neanderthal (60000) could sing and speak before they ever produced a tool. 3.2 Million yrs back in the first stone age . Before that the Australopithecus ,our ancestors ,could speak and sing from the study of hypoglossal canal and the hyoid bone. 21 genes in chimp and man unique to man and absent in chimp are for sruthy/pitch and these help us to learn, to speak and sing and these makes us different from chimp. 99 % are same in both.

Left brain., 2 and 3 frontal grooves ., Broca and vernickes area for language acquisition

Rt brain for emotions *arohan ,avarohan* etc

What the left ear heard the rt brain process

What the rt ear heard the left brain process.

Why we put the child to our left side of chest?A natural thing to do.To have both sides function simultaneously.The right ear of child hears the heartbeats of the mother with which it is very familiar.The left listens to her lullaby with its love ,variations of pitch rhythm and content (lyrics)as language and become calm.

The mother rocks as she sings .The language,the song with its voice and sruthy modulations,rhythms harmoniously processed by both sides of brain.

*Chanchadunni cherinjaadu*

*Thappo thappo thappani. The Malayali mother sings.*

Stops and lengthening and stressing and *thaalam* everything and simple sounds which are repeated .

The three private languages :-that of child and mother –IDS or motherese

Lovers ,and that of *bhaktha* to *bhagwan*.

A child and mother audiophonic feedback a two way communication.25 yrs research shows that the continuity of prenatal and postnatal life is only based on this one factor.The mothers voice.Babies are supremely gifted voice readers (The human voice.The story of a remarkable talent ) By 4<sup>th</sup> year the childs concentration goes to visual language or writing as well and that is the time for schooling.By that time the *mahaamanthra* of the mothers language gives him survival.It is not just a time spending for mother and child but a *mahamanthra* of survival.

2 months. The babbling baby stage . Baby can make 350 msec long swara.

6<sup>th</sup> month protocommunication.9 00 msec (swara/mt) This is by the functioning of the biological oscillation of the neural clock.No other instrument has ever done this miracle.The *saanthwana* is superior to any other.

*Annam ,sradha,praana* ,production of the syllable *Om (a u m)*related to *praanachakra*.as 3-6 sec units.(Paul Freisse cognitive psychologist-food,concentration,breathing time to produce one word by the larynx is 3-6 sec,)

Eye contact develop 6 weeks after birth . Establish looking at object from where sound came. Style of language, interval between two words, melody,recognized and imitated and the mother then understands the child and what he needs through his language .and imitates child .

Too much insistence on *raagam ,thaalam* at this stage can cause vocal arrhythmia.If it is not there at all ,communication obstruction happen .

Medium is the natural love between mother and child . and there is freedom for creativity,originality,the most secure and happy atmosphere.Tolerance to others learnt is by this.The I develop as we.

At this stage mother increases one octave higher the sruthy and fix or stress the *vyanjan* stopping and slowly sings

Some techniques Kerala mothers use for playing with their children and for their development :-

*Kaakka thathaa*

*Olichoo kandooo*

*Aanaa anna kuttiaanaa*

*Kizhakku kizhakkoraanaa*

*Chaanchaadunni cherinjaadoo*

(The child does that to the doll.)

*Amma evide .....ammede ponnumon evidee...clock evide....*(he understands that it is a question directed to him never mind if he shows himself when asked where is the clock).

Turn taking is learned with :- *akkam pukam ekkayyil*

*Olichu kandu*

*Urumbe urumbe*

*Ayyappantamma neyyappam chuttu*

When children are separated from mothers early (in west) this leads to depression both in mother and child

Flat voice ,small sentences alone,in long intervals negative tendencies

Weak very low pitch emotionless –depression

Artificial overmodulation- confuse the child

Best to be natural just as you are .Loving.Love the child at his level .Sing and play with them at their level.

Monotonous metallic voices and emotionless angry voices are not good for anyone especially to a child.

This is all about creative music therapy.

The touch and sound and lullaby of mother bring sleep and peace and comfort

6 months –mothers voice modulations naturally decrease and by 9<sup>th</sup> month when she is sure that the baby recognizes her it stops. By 1 yr her language takes more informational and directional style and she resorts to story telling reading out stories and action songs etc.

## Chapter 13

### QUESTIONNAIRES FOR ASPIRING MUSIC THERAPISTS/EDUCATIONISTS

#### Questionnaire 1:

- 1 can you plan ,and do a simple small project within a specified period of time?
- 2.When you are invited for an informal discussion on the subject in which you are doing research,would you be able to participate and give at least one useful ,and practical suggestion?
- 3.Do you always oppose the opinions/advices of others who have done substantial work in the field ?Or do you weigh the pros and cons and take the best points from them?
- 4.Do you pretend that you have contributed a lot to the field ,though your contribution is nothing or only very little,just to get popular attention and fame ?
- 5.Do you think that I have no time to plan a small project but I know everything about the subject even without doing a small project yourself?
- 6.Do you know or have some idea about the curriculum,syllabus,lesson plans ,materials and books needed ,and the job opportunities the course will create ?
- 7.Do you feel that teaching and learning depend upon individualabilities?
- 8Which is more important for the sake of the public and for the nation and for the world?.To use these individual abilities for the individuals sake and for the society's sake.

9.Is it possible for you to do reflective analytical thought on subject you learn and teach and contribute your valuable opinions in a logical way for the others to be benefited?

10.Are you ready to take joint responsibility in a teamwork?

11.What do you understand by integrated medical project planning ?

12.Do you keep a diary of your reflective thinking on your chosen subject?

13.If so,how do you use it?

14.Do you have a preformed opinion about the outcome of your project and try to manipulate your research work to get that preformed outcome?

15.Are you comfortable with assigning small group discussions to your group of students?

16.How do you classify the small groups?Is it based on gender,age,friends,mixed groups,at random groups etc?

17.Are you afraid of giving your students their choice thinking that it will lead to problems for you?If so what are the problems you foresee as a teacher who have been in close contact with the students?

18.If you have conducted group discussions and allotted such discussions to your students write down how you will lead such discussions,allotting roles to each of the students etc

19.If you can monitor such small groups from different parts of the world ,do you think you can lead any Collaborative,Integrated project work in your subject in any part of the world ?

20.By this collaborative work as a Guru ,do you expect your discipline to grow into a Meta-science?

21.What do your students expect from you as a good Guru?

Is it only thorough knowledge of the subject?Or does it include your enthusiasm and involvement in the subject,your approachability,fairness,and organized behaviour ?Do you think that credibility is the most important aspect of a Guru which a student expects?

22.

Do you agree that the following formula is correct to some degree.

Good Teaching+ A highly co-operative Class =Good Learning.

23.What do you usually do to get co-operative behaviour from your students?

24.Have you ever got a written feedback from your students about your teaching?

25.Have you ever Evaluated yourself as a Teacher from introspection and feedback from your students?

26.From your own Evaluation of your teaching Are you having the grades

Poor,Best,Good,Brilliant ?

(Give poor grade if you are not focused. Give Brilliant grade if at every stage of Transition point you have evaluated your actions and can adjust to each so that the Focus is altered according to the need .The others are in between)

27.How do you assess a Brilliant student even before he/she shows that genius in her/his later life?

From the way they Listened

From the way they did Reflective analysis

From the way they could Integrate their knowledge in different subjects

The interest and involvement they showed in the subject(which have continued throughout life and that is why their Genius was known later)

From their organized Professional behaviour for the benefit of entire society

All of these

None of these

28.Have you identified these values in any of your students so far?

29 Do you think that Music Therapy is an Integration of all Medical healing practices,Music,and all sciences and arts in the broad base of Value-based Education for benefit of entire society and Global peace?

30 Do you think that for such a Discipline Faculty Training is very very Important?

31.In the Discipline of Music Therapy ,there is a Concrete Systematic practical Plan for healing,Personality development and Education as well as Peaceful coexistence.Therefore it has a Valuebased and purposeful social activity.Do you agree with this ?

32.Behind this there is lot of Abstaract Thinking which formulate a basic cause for the action of music on living beings which integrates Physics,Biology ,Medicine and Yoga .Do you agree with this?

33.Have you thought about both these Abstart theoretical base on which the entire Music Therapy discipline is built and also of the concrete practical plans needed to execute it in a broad national ,international level,starting from regional level Educational system ?

34.Are you able to vary your language at key lessons /Projects depending upon the need?

35.Can you offer a range of activities around very clear learning objectives ,including offering the choice of project to the students?



36.Are you able to rotate your Focus of attention depending upon the need of the learner and the client?

37.Do you Questionnaires contain or cover both the abstract and concrete approaches ,so that it is Complete?

38.Do you allow involvement of students in Active project planning?

39.After taking a Diploma in Music Therapy or a Degree /PG in it what job opportunities you can offer to them?

40.To make the job opportunities a reality what suggestions you have in mind?

41.Just tick the left or right column and see how much you have to alter yourself.

Positive	Negative
I am very committed to the cause	Not committed
I am enthusiastic and involved in the subject	I am lethargic and not having involvement
I will give 110% of my ability to the cause	I can possibly give less than 60 % of my ability
I want to be friendly ,but at the same firm in my resolve to the Dharma/Ethics/Values	I don't want to be friendly .I don't want to be ethical or based on any particular dharma/ethics
I want every child to achieve full potential I want every client to feel good and healed with my approach	I am happy if the students just get passmark or may be a rank.  I want the clients not to complain about my treatment .I am concerned only with the legal implications of it.
I believe in a differentiated approach since each person is Unique.	I do not have time for all that stuff.I teach what I know and the rest is the luck of students and clients
My classroom/clients are very interactive and free with me	I do not encourage interaction .

## Questionnaire 2:-

Ask these questions yourself and try to answer.

- 1.What do you read usually for pleasure?
- 2.What music you usually hear for pleasure?
- 3.What are your hobbies ?
- 4.Do you love nature?
- 5.Do you approve of the National curriculum and the present Evaluation system?
- 6.Should teaching be more vocational?
- 7.Which is the duller part of the subject you teach/learn?
- 8.How can you make that part more interesting?
- 9.Tell me about the best learning(class)or teaching you ever had?
- 10.Why do you think that it was so good?
- 11.What do you think is the worst part of a Teacher's job?

12.What do you think is the best part of a teacher's job?

13.If you disagree with an instruction of a subject leader /group leader of discussion groups or of Teacher what will you do?

How you will react to a difference of opinion?

14.What sort of a reputation you expect among your friends,teachers,students etc?

15Think of your classroom.How does it look like?How you would like it to look like?

16.What are the departmental /project responsibilities you can perform with ease and confidence?

17.What is your weakness in learning/teaching ?

18.How should a teacher control a difficult class?Being strict or liberal or by any other means?Specify .

19.What are your strengths as a learner and teacher ?

20.What aspect of your subject you want or need to know more about?

21 When you meet a person what do you expect from her/him?Tick one or more of the following.

You can converse with freely

Someone with a perspective and humour sense

Someone who just listens

Someone who properly discuss issues and if there is disagreement say that frankly and solve it

Someone who has positive views on life

Someone who takes direction and guidance and can work in a team

Someone who can get on with the job allotted even in your absence ,following the Ethics

Someone with a professional turn of mind

Just someone who will say “Yes”to all your commands and will never be a problem for you.

22.When you are asked to provide a Show lesson can you plan it and make it simple within a few minutes and make the listeners interactive?

23.How can you integrate the show lesson with the earlier questions given?

24.Read the statement carefully .

Integration is possible ,only for a person with previous expertise in the subjects and experiences and who has thought of the problems and their solutions beforehand and know what the doubts of the listeners will be from the previous experience.

Is this true or false?

25.If a person cannot integrate without previous knowledge and experience ,and previous planning on possible questions/problems and their solutions ,Integrating different types of Medical sciences,Music ,arts and humanity and Educational psychology for world peace is a tremendous lifetime work.Do you agree with that or not?

.....

1.What is the research topic I should choose?

2 Why do I feel that it should be chosen?

3.Waht should be the main Theme of this Research topic?

4.What background reading I have done to get information about this ?

4.Which research have found out positive results and recommended this ?

5.What kind of a study was that?

6.How many people were involved and how it had been a team work?

7.Where was the study carried out?

8.What was the time scale?

9. When the research is done is the participant's age, gender, social status and musical background willingness to get involved important?

10. How many "Action sessions" were there?

11. What data gathering strategies were used?

12. What attempts were made to reduce the Bias?

13. What evidence was collected?

14. What were the claims made by the research team and how is that important for society?

15. Were the researchers justified in making their claims on the basis of their observations? Were these claims valid?

16. What can I do as the next step to enhance and help this field of research?

17. Have the previous research group suggested the steps?

18. What does that recommendation mean for me, my study and my career?

#### Chapter 14 Living in a world of sounds and lights

We live in a world of sound and light-that of music and cosmic energy. This universe is a harmony of several lives, of several sounds and lights which interact and vibrate together filling the great silence of *Brahman*. Every one should ask “Is my life creating harmony or discord in this universe?? “

We are making either music or noise in this silence. Music is positive pole and noise is negative pole. The divine resonance of positive pole fill us with resonances ,open up transparencies in us ,enlarge our horizons of thought and help us feel the beautiful and inspiring .It nourish and strengthen us .It has powerful waves of life energy and leads us to the unfathomable source , which we call God or just a Supreme power.

Noise makes us insane, in chaos, disconnected with everything, disharmonious, and only music can bring peace, beauty , synthesis, integration and transformation into this chaotic world of noise and balance it . Depending upon our deepest sensitivity we choose the sounds best for us. If someone fails to choose the sound and music best for themselves, a Music therapist helps him/her.

I had been a doctor, a Pathologist and a Medical teacher throughout my life and I had several occasions to observe the effects of music on developing normal and abnormal children, on adults healthy and unhealthy. Music has helped me to learn more with concentration and to age gracefully ,and to withstand all trials and tribulations, to perform my domestic as well as official and social duties with satisfaction. Specific music selections and portions have been observed to contribute in changing attunement, behaviour and productivity of individuals .A single piece of music , carefully played can alter entire atmosphere .Wisely used , music can clear and purify body and increase our immunity and protect us against illnesses and stress which is causing exacerbation of many a disease state , in addition to causing disease states . Though all of us are born equal, we are born into different surroundings, different upbringings, tastes and temperaments and personalities and inclinations to harmonize. Each has a unique personality and a unique type of music that suits , though music is universal for all.

Music brings healing streams of electric charges. But if we are not attuned to it, if we are not prepared and concentrated it need not reach us. If we are well attuned the music will play through us and enter us , not remain as a external thing. So learning how to relax and link great melodies is a key for healing with music. The *Naadalayayoga* begins with such lifelong preparation.

.Take a comfortable position –either on your couch, floor or a chair . If outside , you can lie down on grass . In Yoga practice what we call Sukhaasana is thus chosen .

The 10 keys for listening:-

1. Sit quiet and perfectly silent for at least a minute. Control body (so that it is relaxed) mind (so that it is calm) and listen to our own inner voice which we call *Athman* or soul. That perfect silence will be felt in a meditative silence.
2. Before you listen to the music of your choice , think of it as the grace of divine presence within your silent soul-space .
3. Thus we are able to surrender totally to the music we hear . Be open-minded to what you hear and do not try to analyze it with intellect . Be emotionally, intuitively one with it
4. While listening to music, immerse totally in it with thoughts, mind and body .
5. Feel the music is embracing and filling you completely. The sound of music enters you and you enter into it in that moment.
6. Enjoy the music wherever it takes you without inhibitions. Whatever visualizations come to you will heal you .
7. With that joy of music and its visualizations praise the power which gave you such creative listening . And of course such creative music. The music and listener are one and not different . Feel that oneness.
8. After playing the music , take time to absorb it . Sit quiet for some more minutes and note your feelings , given by the musical experience.
9. Keeping a diary and writing down what came to your mind after these minutes of silence , you can decide which music gave you more happiness, relaxation and healing and which did not give that. (whether the image is a place,,person,colour,nature,presence,shape,archetype ,idea or a creative work truthfully record it).What feeling does the music awaken in me? What feelings it evoked in me so that I act in a different way ?
10. If needed , you can also play the music when you do housechores, or dancing or learning or working etc , that is you can see what it feels with and without music during other periods of activity.

Where you hear the music?

1. Let it be a beautiful place to enhance the beauty of music.
2. Let it be a quiet place free from distractions
3. Be sensitive to sounds of nature
4. If using an equipment , let the stereo and sound system have clear tone with minimal distortion. The brand name or advertising may not help you. Trust your own ear for choosing



5. Take care of your musical system . Clean records when dusty. Play one record at a time. Clean tape heads regularly . Remove dust from equipment.

For increased therapeutic value, you should not be overcritical about the music you listen to. Once you choose your music pieces Love them unconditionally for what they have to offer . Emphasize the treasures of music , not the defects in them. Different pieces of music stimulates different areas in our brain and body . Melodic music , with minimum or solo instrumental accompaniments , and devotional music are quietening and soothing than the full orchestral and choral pieces according to my experience and I find Hal A Lingerman recommending the same for healing . But being accustomed to western music only , he gives only the instrumental music and its effects on us . According to him bass, percussion and electronic notes are stimulating only physical body parts ,(Marches, Overtures, lively songs, epic soundtracks, dances and songs from Broadway shows) string and woodwinds affect emotional aspects (quiet music to ease and calm anger, ballads, devotional gospels folk music for emotional catharsis melody with slow rhythms and pacing for relieving tension quiet music for depression, fear and for insomnia , galvanizing powerful music for strength and courage , wistful nostalgic piece for relaxation, reverie and removing stress) and string instruments affect mental aspects (melodies for eternal love and devotion which appeal directly to our heart , clear melodic , rhythmic music for intellectual power and thinking ) and harp , organ, wind chimes and high strings are for soul which is meditation music..(The healing energies of Music .Hal.A.Lingerman page 24-37)). This is a restricted view from the point of view of the vast musical repertoire of the world, the varieties of musical forms and also the uniqueness of each individual . Yet can be used as a base for our building upon our regional musical repertoire with client needs.

Mediatational music and Yoga have everything to do with Indian Classical and Hindustani music . It also has the Intellectual and emotional aspects . The stimulation of the physical is minimum , but in Indian popular music there are enough of it . So Indian music has all the required elements from time immemorial and what we have to do is to implement use of it in educational, developmental and hospital situations with proper data collections.

In meditation, the listening time is Holy and is a musical meditation. We listen with attitude of reverence and prayer. We are open to spiritual energy of music .

Hal Lingerman's idea of Finding out our music is based on Astronomical teaching and the elements .

Fire:- Aries, Leo ,Sagittarius

Earth:-Taurus, Virgo, Capricorn

Air:-Cancer, Scorpio ,Pisces

Water:-Cancer, Scorpio, Pisces

Music is used to cultivate and activate the expression of energy as they emerge through these temperaments.

Fiery natures like power, competition, surging sounds, strong rhythms, romantic yet dynamic melodies, music of strength and responds to music of victory.

The earthy signs love warm melodies, homey traditional and evocative of friendships and earthly comforts. Music of nature appeals to it with nostalgic and suggestive of repose. It loves music with definite lyrics and meaningful poetry. Loves literal statements to mere suggestiveness. Simple themes often repeated, beautiful and restful tunes appeal to it. Warmth and poignance, domestic happiness, delights of earth and heaven, warm melodies suits them.

Air sign is independent and resents restrictions. It needs rhythmicity, variety and clear melodies. It loves music that moves ahead in a certain direction, yet encompassing a wide spectrum of style and colour. It respond to experimental music, extroverted music, current songs and promotional hit songs contemporary tunes and textures fascinates it for a period and then it get bored and discard it. I don't know why Lingerian included Indian *Ragas* in this category. Possibly he thought that since there is a wide variety of *Ragas* in India it is of this category alone or, his knowledge of Indian raga music is very limited and also of Indian astronomy and yoga and chakra music.

Water sign seeks pieces with deep feeling and contrasting polarities of emotion which bring a total response from heart. It feels before it thinks. If you tend towards dramatic, melancholic music and tragedy will appeal to you. Melodies of power, victory which drive away fears, tears and suffering is suited. Great love themes, deep passions, and human striving arouse the watery signs and their many moods.

Visualization of music as colours, designs, patterns etc is important. Great music stimulate imagination and creativity. The imaginary picturisation of the music or its visualization is more meaningful for each person. Therefore the narration of each person on his/her musical experiences is part of narrative medicine.

Music is an art that express the inexpressible. It is beyond all words and all colours. Yet for communication of our experiences we have to use these. We are taken to other levels of consciousness by great music and deep memoirs of an unknown life may come to you and faithful recording of these experiences for posterity is creative as well as experimental data collection. Thus it is both science and art. From my experience I can say that beautiful music had always taken me to the grandeur of the universe and cosmos and to music of spheres and then beyond, to that great silence what I call the realm of God. Indian classical and devotional music has this quality.

Another important aspect is that great music help us discover and if needed change some habits and behavioral patterns we kept from childhood. The memories of past hurts and past sorrows are erased. The memories of past loves and past enjoyments are stored forever in our musical experiences and their

memories. By music therapy , the therapist can try to enhance the positive side and decrease the negative side by allowing the person to experience and decide which is best for him/her. Music is a real revelation of one's soul. Performance of a Musical Raga or a Kutchery in India is a rite in festival ,not just for enjoyment but for initiation into mysteries of human soul.

Dr John Diamond , in his book "Your body doesn't lie " say that rock music has made the muscles of his clients go weak. (Response of muscle to rock music) and that each muscle is related to an organ in our body. The abnormal rhythm of rock music and its loudness are causing this harmful effect according to him. It is only noise , a sound which at some intensity decrease body energy. Good music and nature sounds increase or strengthen , while detrimental music decrease it . Even a good music , if played loudly for a long time can decrease body energy. Therefore judicious use of volume of music is needed.What is distinction between music and noise? Melody and words are being replaced by shrieks with frenetic rhythms and a collective hysteria is produced . This temporary savage trance is not therapy or healing . Destructive music deteriorates our physical, mental , intellectual powers and leave us weak in all respects .

The Music therapists are practicing one of the most ancient forms of healing and are reviving a lost art and science . The willful person has the power to focus, to concentrate, perceive selectively and most importantly to transform material existence. The therapist fills role of a listener/observer who helps people to see, listen and observe , feel themselves , assist in decoding the complexities of life and dreams and the cryptic indirect messages people send to themselves and to others. The music therapist as a psychotherapist , learn to create an identity (musical ) and a sense of what they really are within the multiplicity of roles that they play in the work and personal life. They find support, self-validation, group inclusion and guidance and to healing through an ancient traditional art. Though art therapy was introduced separate from Psychotherapy, at present the realms are merging and fusing and transforming the field of psychotherapy practice for its betterment. Professional associations and publications by them still separate them but instead of emerging as a hybrid of the two, and instead of remaining as a separate discipline , the universality of music has allowed the integration of all human beings and their physical, mental, intellectual and spiritual healing and the distinctions have faded . Individual art works are not mere commodities , and audiences are not mere consumers and musician is not just a professional earning his livelihood with an art .The creation of good music by a musician amounts to social service because the wide range of music created by him/her is having more ability to heal people and society than the various social reforms of a Government. The judicious recognition of such music and its role and its use for society and its healing is an art and science and a psychotherapeutic transformation of entire society with its illness of separatisms.

Psychology has not yet incorporated the space-time relations of modern astrophysics but Indian music had done it and therefore integration of science and art through music had been a process as old as Indian culture.

### *Community and Music therapy:-*

The verbal communication and narrative MLP of each person will reach the primordial levels of group unity and rhythm and this is achieved with relative ease .Music, arts and drama lends themselves naturally to formation of a collective natural Unity and identity of a people .Therefore the Indian music and dance and other art traditions have to be viewed as a unifying force of entire subcontinent .This is also true of all Indian scientific and philosophical traditions. The integration of all these is possible and then using this geographical cultural and artistic and scientific knowledge , applying the modern levels of scientific research to them gives a unified integrative corroborative process . It is a total transformation by holistic movement of integration and corroboration. How this is implemented is important .

According to Shaun Mc Niff (The arts and psychotherapy pp 4-5)) the drama and music (theatre) started form shamans for visualization and group identity and transcendent oneness of a group. He says the Shamanic healing is a right hemisphere phenomenon and the teacher (voice within oneself) is the illness and individual by a dialogue with this teacher (communication of organism with itself) reestablish balance and order. This self healing and balancing is initiated by a shaman , the psychotherapist of the group/community .The value of placebo effect was fully appreciated by these early healers and in 1978 I.M.Lewis described Psychiatry is a latent shamanism and shamanism is often more than Psychiatry.(Ecstatic religion: An anthropological study of spirit possession and Shamanism New York Penguin 1978). Both aim at balancing the individual and environmental relationships, but psychiatry lacks ability to relate to transcendental source of life and dynamic pulse of creative action. The integration of music and arts to modern psychotherapy allows us to have benefits of both, but without having to go back to savage practices of shamanism. The shamanic way of dream power is made use of by modern psychology . A circular enclosure of sacred place is always chosen by ancient cults to do healing . In artistic musical and dance performances the performer and the audience together make the circle , thus uniting the powers of entire community for group healing. Circular imagery is the mandala in Jung and this was used by India at least from Indus Valley/Harappan times as we see from the archeological evidences and also before that from the cave pictures dating back to 10000 BC . The musical circles of Melakarta raga in Classical music is in the same pattern. According to Gestalt psychology the experienced order in space-time is always structurally identical with a functional order in the distribution of underlying brain processes. (Kohler Wolfgang. Gestalt psychology New york.Liveright 1970 pp 61.)

Both in psychotherapy and shamanism the training of the healer have direct effect on healing process. He/she has to keep the client's mind to positive thoughts by art and science of his/her discipline. Sigmund Freud contributed greatly to renewal of a shaman's role in society by a psychotherapist . His dream interpretations had several things accepted from Shamanism .Jung vitalized the spiritual and archetypal ancestral memories in each human being as a collective memory of the whole race . Freud's discoveries were those of an archeologist of mind and emotion. Jung's discoveries were more holistic

and integrative of entire human race and its spiritual and intellectual, emotional heritage. Slavery to the Freudian ideas have made psychotherapy very limited in its use. Because the therapists are always thinking about a hidden feeling (a hidden agenda!) and give inadequate attention to explanations offered by the artist (by the client ). Creativity and creation itself is a motive and everyone loves to create a unique style and express it or communicate it as a mark or symbol of identity. So is every society. To try to find out any other hidden agenda for art is like distrusting everything and that is a negative aspect of Freudian psychotherapy. The series of motives or one motive above the other is always individualistic and unique for each one of us and mere generalization is not correct.

The motivation theories are

- 1 Equilibrium/order/Balance
- 2 Competency/mastery /skill/expertise
- 3.Exploration/resolution of uncertainty/knowledge /discovery
- 4.Aesthetic pleasure /intensification of life
- 5 communication/relationships
- 6.Achievements/social recognition
- 7.Emotional recognition/sublimation
- 8.Fear /fearlessness
- 9.Mortality/Immortality

All these and any one or more of it in combination exists in each individual and his/her symbolic expressions in word, art, deeds and in thoughts .

The therapist should know that each individual has an artistic healing power within . And should believe in that healing power. If you don't believe in that power within yourself, you are not fit to be a music therapist . Unless you believe in it yourself, how can you help others with it? So self-experience is the first thing to achieve. Before you start teaching others or healing others, teach yourself, heal yourself . The attitudes and values of the therapist has a definite effect on people/clients (Frank Jerome; Persuasion and healing. A comparative study of psychotherapy .Baltimore. The John Hopkins Pr 1961)

Obstacles felt:- The most consistent factor is time and emotional drain of the other jobs .Demands and responsibilities to others, to profession, to families etc. For students the demands of professional study also has the same problems .The distractions of such demands makes the total involvement and dedication difficult , says many a professional and a student alike. To overcome this ancient India had

some systems of free education for students at Guru's residence and the Guru was given facilities for providing free accommodation, food for the student, through state allowances of temple lands and the like. The system is continued now in universities with state grants, but not entirely free as in ancient times. What we can now do is to manage our time efficiently without making the obstacles rule over us, but ourselves being in perfect control of all obstacles. This I say from my own experience of a busy professional and domestic life of responsibilities of manifold nature. Our effectiveness as expressive art therapists come directly from our involvement in and personal explorations of that particular art. Our ability to support the value, respond to intensities, of a client's needs and art will be directly proportionate to the extent we feel these forces within ourselves.

Emotionally troubled people tend to complain of loneliness, emptiness, depression, confusion, and a very negative sense of self (Page 64. *The Arts and Psychotherapy*. Mc Niff). If a creative artist (novelist/poet etc) always express such thoughts a psychotherapist should realize his/her needs for balance of emotion. The visualization techniques of the western music therapy to give suggestions to think of a part of body (with disease) as a still lake, floating cloud or any such fantasy imagery is good for such people. These guided imagery or fantasy techniques used by west is not needed in India since each Raga in itself contains such imageries. And just leaving the client to immerse in a *raga*, natural feelings of the *raga* can be used (without any suggestions from therapist), according to the client's choice and only in extreme cases (where no creativity is possible due to severity of disease) a suggestion from therapist need be used. The children and adolescents may be helped to control and direct their expressions of emotions by their own natural ability in this method. Scribbling the experiences, thoughts with or without an accompanying drawing may be attempted as exercises with each music session. The spontaneous creativity is stimulated by this.

Use of rhythmic music as stimulus for creative action existed in shamanic cultures as drumbeats (percussion instruments) which summon the spirits. In people with lack of consciousness and in slow reactors etc this can be of use to invoke creativity and for a warming up of energy. Repetitive rhythms are for warming up and in concerts the Varna rendering is such a warming up operation. Predictable sounds and movements in beginning help people to relax ego controls and flow with the music. Consistent rhythms help support the emergence of synchronous movements and a sense of group unison. Chanting also have a similar effect because of repetition of sound pattern which sustain attention while relaxing participants and enabling them achieve a trancelike state of concentrated mind.

Warming up exercise limit perception by focusing attention on a particular object. This type of exercise sharpen the figure-ground perception and demonstrates how contact can be made with different objects in environment by the same technique. Similar exercises can be initiated with selective focusing on sound patterns and movement qualities. Figure-ground perceptions can lend themselves to creative writing warm ups by having clients write the visual descriptions of the music they experienced. Metaphorically by freely associating the listened music with the various images that enter the consciousness the person is freed from all obstacles of self-expressions and enjoy the creativity and wants to explore more into such experiences and this has to become a part of life. That is the therapy, rather than a temporary activity, becomes a way of life to the community as such. With this the client finds more easy to contact and communicate with therapist as well as others. The music that evoke

emotional memories engage the person in dialogue with external world and they become more self expressive and open . Sometimes a great musician who had wanted to freely communicate but found it difficult to do so ,becomes very communicative after a few sessions with a music therapist and the transformation in him do good service to the society he/she lives in. A creative music therapist can achieve this, even without the musician ever suspecting that he/she is made an experimental model by the therapist , in the interest of the entire community .(If he/she knows it ,he/she may resist change/transformation due to ego or some other conscious reason which undermines the whole use of music therapy on a musician which aims at healing of the society as a whole). The totality of the therapy can be seen as the warming up for life. .Spontaneous writings , prose and poetry , that come out of musical experience in itself has a healing power . Whether you call the creative expressions as poem or not they are creations of a human soul . The clients poetry need not be first class poetry. Their music need not be first class music . But by expressing their arts , their music , they are healing themselves and you as therapist is motivating them to do so. That is a community work and not something which you are doing for getting an award or a Nobel prize or for a monthly professional wage/fame as musician. Reading poetry, reciting *Aksharasloka*, filling up *samasya*, playing group and solo music and dance and folk arts and drama ,reciting stories and narratives our ancestors gave this healing touch to entire community .We think that , every thing they did were religious according to our modern concept of Semitic religion and pseudo secularism . But the modern experimental evidence coming from all over the world in fields of human consciousness, ideas, arts and healing show that they were not so .They were efforts through which ancient human consciousness devised educational system so that entire society benefit and no single person is left out of the scheme. Every single person and his/her needs are integrated in the educational art psychotherapy of the ancients and a deep study into this educational system may sometimes shock us because we have an ego that we alone are superior and ancients were inferior to us .This ego may get a shock if we compare modern and ancient knowledge systems and the practices. Within the client's personal language system and understanding, the therapist has to devise his/her schemes. Thus when I used the *Melakarta raga* schemes I used Malayalam lyrics (which unfortunately was not available till that time and so my own poetry had to be used) . Unless we have geographical and language contexts of the population on whom we are using therapy with music , our efforts may not succeed . Though universal, music has some regional peculiarities which makes it popular in some groups . India having all sorts of music suited for all its population the selection is not a problem .When we use vocal music with *sahitya* in it we are combining creative approach of language psychotherapy as well as that of music and this is the most useful for a person who has already developed language skills (adults) and also for children whom we want to develop language skills . In people with no language skills (mentally or intellectually or physically deficient) one can resort to rhythms , to instrumental music etc as the case may be according to the client's needs and liking. For others the language and music combined therapy is more holistic and integrated when compared to that without language. The nature of language and music centers in our brain is such that both function mutually for cognition and understanding and processing of memories.

Sound is a sense modality directly connected to expression of emotion. Making and listening to music is cathartic, gently stimulating and calming. Music can summon life from the dead, calm the most aggressive of the beasts, motivate even a malevolent force to act benignly towards society (others). The integration of artistic and spiritual realities into psychology happen as study of behavior evolve from its earlier and very exclusive focus on parental conflicts and other forms of psychopathology . Music is the universal language of the soul in all traditions and cultures all over the world. Because of the invisible nature of sound energy as vibrations this divine nature is ascribed to it. The human mind transforms this invisible unmanifested divine vibrations into expressions of joy of nature by musical expressions of a great singer . The sound of nature is also music. But it differs from either live or recorded music from a singer/human being . It is pristine pure .

The music therapy sessions are not just listening to music , but speaking about what we felt and recording or creatively expressing and sharing those thoughts with others too. It is exploration and improvisational expression of feelings of the musical moments . Music being a rich source of personal associations, stimulates recall of personal emotional memories. Recordings of your favorite singer can be used to facilitate guided fantasy or imagery experiences .The selections made by you and the therapist in a scientific integrated way has to relax and then make creativity bloom within you for a positive effect of healing. Music followed by sharing of emotions, discussions and interactions unify people for positive results . Music listening may vary from one minute to 15 or 20 mts or more depending on attention span of person/groups and after that I usually ask them to give what they felt in writing. Such written feedback data has been used in my research extensively . Since my audience have a varied population (from astronomers/astrologers/other professional groups of different modalities of medical practices, philosophers/historians/teachers/students and music lovers) the feedback has shown me the unity and universality of all these diversities and also the uniqueness of creativity and healing power in each person . I have found that the egocentric scholarly people are having more resistance to self healing than any other group because they fail to get involved in music). My orientation towards the working of sensory awareness and listening skills, interpersonal and intrapersonal intelligences and interactions/dialogues/discussions/sharing of musical life panorama and musical feelings and resolution of conflicts through a musical medium has been discussed in detail in my previous works on music therapy. Sound dialogues between client and therapist, between individual group members or subgroups within a large group happen with musical healing.

*Withdrawn , unresponsive people:* just echo the therapist's opinions like mirror movements in a dance . Just show that they have heard and understood and likes the concept .This is part of dance therapy and music and dance being inseparable has to be taken as the integrating principle between these two . (Kinetic intelligence of body in Gardner Multiple theory of intelligences).

*Observe a singer.* The bodily expressions of the singer while singing and while not singing or while making improvisational voice sounds. We will find that his whole body tends to move in synchrony with the sound pattern , giving them a visual form of expression. The voice comes from within the person's entire being (body, mind, intellect and soul) and not just body alone . But the body organs and the visible and audible and felt parts being accessible to our sense organs of cognition we start from that . We start from the seen and heard and travel to unseen, unheard and unmanifested true being of the



singer. This improvisation with a singer needs a lot of listening with his performances and also out of performances in his natural settings in a friendly atmosphere and deep understanding , which is mutual between the listener and the singer . I have been doing this experiment for the past several years with my favorite singer and I can say how important it is for both listener as well as singer to bring out his/her total personality development for community as a whole. The only test for it is what happens to both these individuals after such a sharing between them and how it becomes useful for community/society they live in.

There are four primary factors of movement relating to use of space by an individual. The space means the quantitative measurement of one's body's angles and patterns when moving . The same applies to movement of swara words etc in music also. The space, weight (measurement of strength and force of action/words /letters etc) the time (temporal span of a movement ) and flow (continuity , pauses, interruptions, of a specific movement) are the four primary factors we listen to . But there is in addition the gestalt of the entire person, the actions consistently performed , transitions from such actions influenced by some other force /or individual, and evaluation of all these together makes up a response of a person to a music therapist .The effort and shape of entire sensory expression gives us a clue to how significant is therapeutic application of art , especially music in healing. The regular observation of a single singer's performance and actions closely needs patience and an intense involvement and love for what research you are doing on that singer. In the last 10 years I closely followed Padmabhooshan Yesudas as my favorite singer and attended (between 2000-2010 ) more than 150 of his classical concerts to do this research on musical repertoire. The time, energy, effort and involvement , nothing to speak about the expenses of such an activity has shown me how important it is to love what you are doing as a research to do justice to it . Many students coming and asking for guidance in Music therapy , are not prepared for concentrated involved research at least for an year . They are not willing to do a project with real patients or children or any chosen group of their liking, following the standards of accepted research and wants to be spoon-fed by what we have acquired . That is not the correct attitude to genuine research in any field.

Hal Lingerman has suggested that each artist gives out a particular quality of energy to a particular listener and he has also studied the elemental signs of a few western artists to analyze their music. He gives a short account of sound and color relationship called synesthesia and that sound is visualized by people as colours. All these I have already discussed in my own experience in all my writings and the western ideas of music have their roots in age-old Indian concepts . The potential power of music to integrate personality and temperament, to awaken our soul, to link us to enlightenment and greater intellectual, mental levels with perfect body health has been recognized by 20<sup>th</sup> century researchers just like those ancient stalwarts of Indian music thousands of years ago. What, we in India needs is the integration of music into all wakes of life , into professional and domestic life and into developmental strategies of human resources and for solution of problems of the ailing society and human beings . Ultimately the music as universal language is for peace of entire living world , by integration, corroboration and compassionate understanding . Music is Love and Compassion. And that is God itself.

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## chapter 15 Measurements in psychological field and mind space

Since homosapiens evolved, we have been observing, comparing, seeking to classify what we observed, recording these observations as memory of generations of human races .The concept of these measurements we can see in every civilization. The mathematical precision achieved by Indians, the archeological and literary evidences for it is extensive as we all know. These ancient concepts have gradually lead to human values, conditions, lifestyles, culture and development of evolution as a whole for millennia. Therefore, negation of such values and sciences and arts of our legacy is like a suicidal action which will kill our own culture, heritage as well as self-awareness.

Truth or reality is objective and can be measured or verified by methods which involve a unit of measurement. This was learned by human beings (our ancestral homosapiens) living in India from very ancient prehistoric times. They understood that knowledge for transference to next generation has to be reduced to objective dimensions for easy understanding and verification and later on integrated . For this there should be subjective experience of truth by each one verifiable by the objective measurements of truth. It is this method which we see in the Upanishad traditions.

The student who study the culture of a people is studying the stored memories , the cognitive processes and the methods used for it , perfected through millennia .When we speak of Indian classical music as a tool for healing individual mind, and thus the entire society and the world through principle of integration we should not forget this fact.

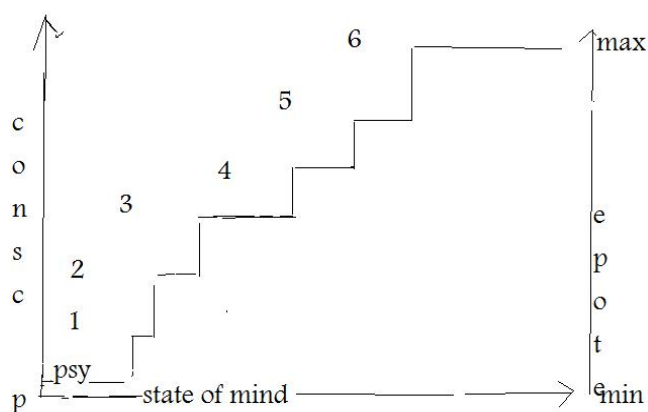
Meditation with chanting musically increase the coherence, harmony in our brain waves which give great synchronization of the two hemispheres .This allows a higher order to be achieved spontaneously

(without effort) from a lower order .The higher order imply a higher quantum of energy potential also .Communication through music thus gives both *shakthi* (strength) and *shanthi* (peace) for individual and society.

We know the uniqueness of man is his power of communication. The symbols man created for communication are many. The language and literature, arts, sculptures, paintings, music and dance-drama, various sciences etc are such symbols of communication. The intellectual description of these as jargons like logic; semantics, linguistics, metalinguistics etc are there.

Analysis of words related to things, processes, events, meanings are guidance to the fundamental problem of relation of man in his psychosocial totality. The *naama* (name) *roopa* (form) of *prakrithi* (nature) is thus known by the knower (*Athman/Brahman/Jeeva*) or cogniser, the creator and transmitter of the symbol and his/her successors is a very ancient concept .The observation (*darsana*) the data (forms and details of it) stored as a symbol (*naama* in language with a picture as symbol drawn in caves of ancient man) started as early as human race itself .So science is not a new thing but the oldest human activity. This is the most nonviolent communication through a holistic, wholistic, scientific and artistic integrated way which was known to our ancestors of India .There had been violent communications of power and separatist tendencies in that history, but such violent actions were kept well under control by the supremacy of the nonviolent teacher (*Guru*) lineages who had academic, valuebased training. Even the nonverbal communication of a *Guru* observing silence was considered the best communication to reduce and transform the violent one-the *kshathriya* warrior class.

diagram of mind states with 6 quantum jumps below which explains the maximum energy potential of mind and maximum expression of consciousness:-



Consc= consciousness

Epote=energy potential

P=physical

Psy=psychological

1= the first quantum jump of scientific thoughts

2. The second jump of discoveries

3. Observation for verification of what others say

4. Pays attention to values

5. Awareness and self-referral .self-analysis

6. Meditational /universal consciousness .Oneness of creation

Both violent and nonviolent communications are functions of quantum energy potential or hierarchical expression of consciousness as functions of chronological time. (That is in two developmental stages ).Violent communication is at a lower level and constructs a false duality or *dwaitha* (separatist feeling).Nonviolent communication is at a higher level and the mind starts to comprehend the truth of oneness (*advaita*) which enhance awareness of values.Intuition is at much higher level and it works along with nonviolent communication and moves to the maximum communication even in silence as in *dhyana* of a Buddha .There the timeless message between two souls happen without language (between *Guru* and *shishya*).The *Bhakti* to Guru is thus at the nondual frame of mind where compassion and love are most for entire creation.

Albert Schweitzer said: - Be reverent towards life.” Because life is valuable in itself. Man’s psychological evolution is unique and it is beyond the biological evolution of Darwin. The quantum jumps happen when love for all happen and it is not an evolutionary ladder but actually a wheel that self perpetuate by repetition.

This is where the spirituality and science meet at the practical side of life as well as at the logical, analytical theoretical levels . At the right and left brain levels they merge in harmony. Whatever dissonance is there will be nullified for a total integration of personality for welfare of entire life and survival of all races of life forms, from a tiny unicellular to the complex multicultural human.

Thus the modern science and ancient spirituality are not contradictory to one another but has to be known in the proper perspective and integrated. The universal language of music is the best for integration of everyone and all branches of knowledge for healing to happen.

There is interdependency of all branches of knowledge , since there is interdependency of our brain parts which occur between cortex, hippocampus, and between numerous nerve channels and plexuses . If an electric current is given to hippocampus, the changes will be seen in cortex though it is not getting the electric current .Brain is an integrative organ by nature. It is not hierarchical as the mosaic patternists would claim. It is what distinguishes brain from a computer. Computer is synchronous and totally regulated while brain is asynchronous. Human mind is flexible while computer is not. At the synapses lie the choice point which converts the human brain system from a dull one into an uncertain dynamic interesting functional one.

Computer	Human brain
solid	Animated
Programmable	Defy formalities and programming
Not flexible	Flexible
No free will	Free will
Predictable	probabilities
Synchronous	Asynchronous
Hierarchical	Integrative
Machine	Nonmachine
Artificial	Natural
Cannot comprehend natural language	Comprehend natural language

How does the human mind work?

How are our intelligent thoughts propagated?

In what form memories are stored?

The first door to unbolt and find answers is the ***research with languages***.

The second door is the ***research on thoughts and how our brain produce a thought***. The third is to ***penetrate a human mind at its highest functioning order*** (not at clinical psychiatry and clinical psychology of deranged mind function). Then we find that our languages are only the tips of an iceberg

.The expression of a thought by a specific symbol is language. It is an efficient method of communication or expression of our mind, our thoughts. The thought and language are thus intimately weaved. Language is the way to secrets of human mind. A natural language is developed by natural thinking of humanity and generates a wider universe of thoughts, concepts, and inferences from each structure it understands.

Music is another symbol which communicates very effectively and used by all our ancestors and is universal to homosapiens. The silence of tropical forests and the musical birdsongs have been suggested as the first development of saaman chanting in Indian subcontinent by researchers. Thus the first natural language a human ancestor developed is music. The human larynx and vocal cords could sing before the human thumb was developed to make him a tool-making animal. That means even before tool-making stage human ancestors sang. This is the most natural faculty and the first and best developed in a child too. Integration at this universal level is therefore most rewarding and practical.

Computer as an artificial intelligence has several important functions and impacts in current society.

1Potential impact on healthcare. The diagnostic expert systems complementing the knowledge of the physicians

2. Education:-Through computer one can set up individual tutorial lesson plans based on each student's need and ability to learn. The vistas of educational field with computer is ever-expanding

3. Social welfare: For the isolated, the disabled, the intelligent machines as companions and as physical therapists

4. Policies:-Assess the ebb and flow of public opinion, presents reports to influence decision makers at a quick pace

5. Quality and organization of life has improved.

With all these a computer is still inferior to the human brain. And it is just another technological tool and an improvement in the tool making potential of human beings which has evolved over millions of years. It cannot replace the human brain and cannot sing the same way as a human being (even a small child) sings. Therefore to measure the child and its potential computer is not enough. A living loving person with a dynamic brain –a parent, teacher etc- is the best judge of even a child. This is true of every relationship and every judgment made by a data processing machine and a judgment made by a loving living brain.

*Bharthruhari* has rightly put:

To judge a jewel a goldsmith is needed..

To judge Krishna only a Krishna devotee is needed.

Like that to judge music a music lover is the best authority..

But do not forget! There are different modalities of music and types of music and each one has subjective likings. The best is to be decided by the joined effort of the client and therapist to suit the needs of each person and it is an interpersonal intrapersonal relationship , based on integrated approach in medicine . It needs some specific training for the therapist to choose what is best for another individual and to make it work wonders too . Compassion, love for entire creation is the message of this new discipline but it is done in the most scientific possible way using protocols of research accepted by medical science.

#### Chapter 16. On dreams and human perceptions :-

Unlike his Guru Freud ,Jung did not popularize his ideas .He conversed with only academicians who understand the language of his research and discoveries. Then he had a strange dream. He had a vision that he was speaking on a public platform and common people were enjoying and understanding what he spoke and were giving him feedbacks. After this dream Jung started to converse with nonacademic world on his discoveries.

The idea of Jung , that a person's most important, significant and truthful part of consciousness (which is also unconscious and superconscious) is a transcendental realm beynd waking state is as old as human race. The human language, arts, sciences, symbols etc are both cause and effect of his/her dreams which have communication powers. Through dreams we converse with ourselves.We know ourselves. But there is an important thing. I know my Athman and my life through my dreams .The dreams converse only with that particular dreamer. The symbol or a music in a dream converse with the particular dreamer only. What I interpret of it is what I become. The best analyzer of one's dream is oneself. Otherwise a Guru who have known my mind, karma , words and life thoroughly. That Guru is the best psychoanalyst for a *shishya* in a Gurukula. ( In *Saradathilakathanthra* , the student whose dreams the Guru interprets is called a *Swapnamaanavaka*) The analysis of dreams is an entirely

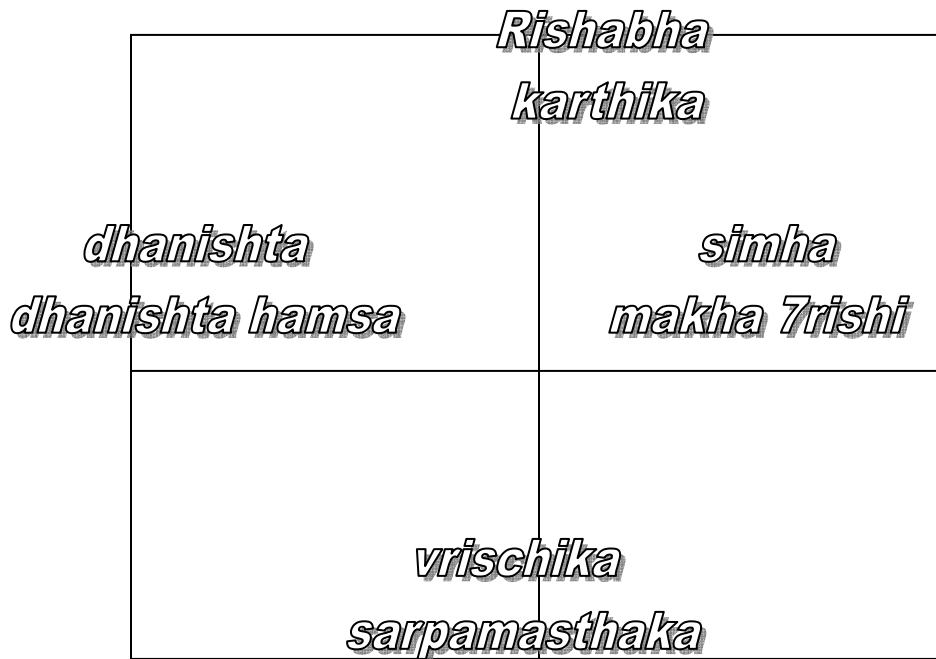
personal individual business, important to the dreamer only. A constantly introspective intellectual mind , a contemplating mind can see the turning points in one's life and converse with one's own transcendental self through dreams. Jung said that such a ability to converse with the transcendental self is a characteristic feature of a perfectly developed whole human being. If one can give an important place for dreams and call the transcendental presence within us as God , we can enjoy and cognize our life in its entirety. When we cognize that the sakthi or power which we use and its symbols had been in use by entire humanity from time immemorial , that power raise us to a realm of creativity and transcendental existence. This was Jung's idea .

In Bible we find Ezekiel having a dream. He said in the 30<sup>th</sup> year 4<sup>th</sup> month 5<sup>th</sup> day the door of heavens opened and he had the vision of God. He saw a whirlwind from the North. A great cloud. From it a fire. In that light four creatures with human form. Each had four faces and four wings. That is 16 face and 16 wings. They had hoofs. Colour was bright copper colour. On the right was a lionman's face. Left was oxman with a eagle. He heard a voice like thunder. Ezekiel heard a distinct voice also. Psychologists interpret it as the four evangelists. They say Lion is Mark, Ox is Luke, Eagle is John, etc but Evangelists existed several years after Ezekiel. In the gospel of Lion Mark, the beginning itself speaks of healing powers of Jesus and of the white pigeon of peace.

In Egypt the Sun God, in India Vishnu and Krishna have a *vyuha* of four always accompanying . Ezekiel speaks of such a *vyuha* of God , not of Biblical evangelists.

The Cosmic *Purusha* of India having a *Simsumara* (whale) form in the skies has a diagrammatic representation of + called the symbol "*KA*" in *Veda* designating *Brahman* and as a alphabet in *Brahmi*. This is drawn as below:-





In fact

this is what Ezekiel saw in dream. And probably he had knowledge of it from the Assyrian ,Babylonian connections .

A word is understood by different people due to their language and cultural difference with different meanings. This truth is spoken by Jung when he shows the symbols of each person's life and dreams. A number for an Indian *rishi* and mathematician is a value of divine thought. But for a commercial person in a market it is value of money only. This difference do exist in symbols and that is why a person's symbols are important for that person only whether in dream or life. Poincare, Kekule, Descartes, Robert Louis Stevenson, SreenivasaRamanujan , Goethe had dream visions and symbols through which the life mission was realized. Einstein had a thought experiment and vision of traveling on (sitting) a beam of sunlight to formulate his theory.

The growth of body and mind have no difference. A plant brings out flowers and fruits in time. Similarly when the time comes human mind creates symbols for its own growth. The visionary dreams are proof of such creative moments according to Jung. By this analytical psychology Jung removed the imaginary difference between ancient human beings and modern scientific homosapiens. Both create symbols and see them. But the difference, he noticed , is that modern man has lost the ability to see them as meaningful, because he has categorized them as meaningless illusions of mind . They do not recognize them as symbols of one's own natural growth directed from within.

The simlie of a flowering plant shows the creativity in dreams. The rebirth and reconstruction of the same order is implied within it. It is a resurrection of creativity or a new creative self from the old forever repeating in a cyclical order and seed of the plant is important for it and therefore union of hearts/minds .The real *Upanayana* or initiation happen through such dreams according to Jung , and the awareness of eternity bloom within us. Jung said that the modern science of psychology by calling all dreams as signs of mental illness (illusions) or by ignoring them as mythical, is creating a danger of not

knowing ourself as a whole . This was where he had difference of opinion with his *Guru* Freud, who did only dream analysis in a clinical set up on deranged minds. Mind is not deranged mind alone. There is mind of a perfectly controlled Yogin at the other end of spectrum. Without knowing it , generalization of all human minds on the clinically deranged minds is dangerous to humanity .

Jung describes the creative ability of *Anima* in a person. He/she dreamt of a journey. He climbed a hill and saw a portcity. A clean calm waterbody. On its shore a calm portcity. According to Jung the mountain represents the strenuous journey of our *karmic* life. And the calm sight above is the goal we reached . The waterbody is a feminine symbol of *anima*. A man dreams of *Anima* within them as a dragon when they have lot of desires and when desires are over , they see it as a protecting divine mother .That is during adolescence only a man see the shadow of woman as sin and *satan* and in old age she is the eternal mother who protects and consoles him. Desire or *kaama* is a shadow in one's own personality and when mind becomes more and more mature , it takes a soft compassionate motherly divine appearance . That is interpretation is only a symbol of what you are and how much maturity you have aquired. It has nothing to do with the woman but everything to do with maturity of your own mind. This is for oneself to assess and analyse and not for others to say . Symbols are belonging to each individual, to entire societies and for humanity as a whole.

In ancient races the symbols were related to totems of animals. *Naaga* or serpent is such a symbol of all ancient people. The *Naaga* tribes of South India , and North India together called the *Saindhavas* , especially *Vaidya*, *Yogins* and philosophers of India it is a common symbol. Egyptians had it as a symbol of wisdom. According to Jung's theory only an immature mind will be afraid of it as a sinful symbol or dragon. One who is beyond timespace limits and one who has evolved above desires know it as an eternal symbol of wisdom. Jung said , Christ is a serpent exalted on cross , the lion and in rare cases the Unicorn. Christ has said in Bible “ Ye be wise as a serpent ...”

Greco-Roman Dioneceus and its successor Orpheus mysteries the God for initiation is androgyne just as *Mahath (Saraswathi)* in Veda. To know it one has to cognize entire life, including plantlife (which is possible in a biodiverse tropical region only) and their languages. Without knowing plant and animal diversity and life one cannot know divinity .The cyclical creative and reproductive cycles and their relation to cosmic seasonal cycles is best known in tropics and tropical forests .The words *Madhu* (honey) , *Soma* (nectar) etc and *Annam* (food) and its cycles so well described in all Upanishads and Vedic scriptures is due to this geographic peculiarity . It is the best *Oushadhi* (medicine) for growth and health of body , mind, intellect and spiritual growth.

Here the feminine aspect is health, wealth, education (*Parvathi*, *Lakshmi* and *Saraswathi*) essential for survival of all races and it is not conceivable by the jagrad state of day alone. The dream (*swapna*) and dreamless state (*sushupthi*) and the *Thureeya* visions are also there for human mind . That is why the feminine aspect is *madhu* (which gives eternity as well as a state of sleep) for races and survival of it and *Vaidhya* or *bhishak* (doctors) of the land practices *Madhuvidya*.

In Biblical sense , for union with a male a female needs a state of stupor , and only in that state she succumbs fully to the act of union which is essential for racial survival. This concept developed from the Greek story of Dionysius who gave wine to Ariadne so that she unites with him. This is still followed by churches all over , copied from GrecoRoman cult. But there was one person who questioned this . Orpheus. He didn't take or give wine for union. He gave the music of his lute for union. The external wine is substituted for an internal bliss of music which surrenders all . Thus in Orphean mystery the wine is substituted by music . Orpheus is a prophet, musician, and a new Guru , a perfect individual. According to Jung Orpheus is the prototype of Christ . But the giving of wine in marriage ceremony is not that of this prototype but of Dionysius.

Both Krishna and Orpheus give the music of past and present and of future ; The music which is timeless. The fertility of mother earth, agricultural rituals associated with seasonal cosmic cycles, symbols of cosmic and earthly nature associated with it , eternally repeating cycles of this nature –*samsara* for racial survival of all life forms- are represented in Indian scriptures and in the symbols archeologically available from the subcontinent. The music of Krishna is represented in many symbols available from IVC and Harappa. Animals, birds and human beings are spellbound by the flute of Krishna and by the lute of Orpheus and thus Orpheus is an adaptation of Greeks from Krishna . There is no difference between symbols of humanity . If a symbol comes to us , it is just for us to analyse and know where we are leading to . Divinity is just coping with life and cognizing the divine within us and everywhere in nature . When they are reduced as mere rituals and made into organized religions , the spirituality in it is lost .

Transcendental symbols:- When a very important situation or turning point comes to our life, the symbols naturally appear. They are like a *Guru* who does *Upanayana* (initiation) for us. The Guru come when the hour of need arise , naturally. Gives what we deserve. Gives power for us to fly high in transcendental planes (*Aakasagamana*). Therefore bird is a powerful transcendental symbol. *Garuda* is a symbol like that which brings Nectar or *Amritha* . The wings and the sound of wings which Ezekiel heard denotes this. The symbol function through the medium of a single individual , or through many and in a trancelike state give us intuitions of past and future .

A journey –a sacred journey –itself is a symbol. A journey in dream is a journey into soul . After climbing a hill , ( your *karmic* efforts) if you find a stormy and turbulent waterbody (ocean or lake) your goal is not yet attained. If it is calm the goal is attained and success is yours. If we find ourselves in the middle of a calm ocean , it shows a meditative state in perfect bliss . My dream on *Vridhachala* at age of 8 was that . In a sacred journey the meditating person or *Upasaka* knows the nature of both death as well as eternity and it is natural for the upasaka. To quote Jung's words :- "In a spiritual pilgrimage , the initiate is acquitted with the nature of death. It is a journey of release, renunciation, presided over and doctored by the spirit of compassion."

This Goddess of compassion is the supreme feminine power which Jung calls his *Anima*. In Buddhism she is *Quan-yin*. For Christian Gnostics *Sophie*. For Greeks in Athens *Pallas* or *Athena*. And for Indians *Saraswathi/Parasakthi/Mookambika* ..

When we have to put forth our most important step in life without help from any other person, she appears and gives us her vision, says Jung. When life needs a change in course she comes .

As T.S.Eliot wrote in *wasteland*:-The awful daring of a moment's surrender which an age of prudence can never retreat.

When we cant go back , and when we need all the power of will to do a complete surrender she comes as the *Paramaguru* and initiates us. My two poems at the age of 8 when I had the dream of that calm ocean and *Vridhachalam* in its middle were like that .

( One on Death and the other on total surrender to Saraswathi) and they came in a most important point in my life when I lost two of my dearest people, My grandmother as Yesodha to me , and my Guru , her brother .Usually such moments happen in middleaged people , old people etc and the cowards who have no courage to take a risky step will avoid taking it. Selfsurrender is the most difficult thing to do . Those who are *Dheera* (courageous) totally surrender to the internal call or message from the self. Jung takes both serpent and swan (*naaga* and *hansa*) as symbols of such total surrender. They symbolize a deep , unfathomable transcendental plane according to Jung.

The symbol of eternity and wisdom and *prajnaparamitha* is the *Naaga* for Indians .*Anantha* as the symbol zero indicates is the eternal time . For Roman Medicine it is the symbol of Esculapeus . For them the serpent climbing a tree or a branch shows uniting earth with heaven. For Indians the concept of *Kundalini* arising from *Mooladhara* and rising to *Brahmarandhra* (*sahasrara*) is the symbol of *vaidya* or health.The *jalasarpa* (serpent in a ocean) or *Anantha* is the experience of Bliss or *Rasa* , because *rasa* is the quality of *Aapas* or water. The twin serpents *Aswins* are divine vedic scholars in two directions (representing NE and SW monsoons traveling in opposite directions , encircling the globe).For Greece the two serpents are the symbol of *Hermes*. It denotes liberation and healing powers. The same symbol is there for *Thoth* with a birdhead of *Ibis* in Egypt, for the planet *Budha* who is the ancestor of all lunar dynasty kings of India , and for *Samba* the son of Krishna in *Sambavathy* daughter of the oldest *Riksha* king *Jambavan* . They are all wellversed in music , astronomy, medicine and healing arts and are scholars .

What is the Greek *Hermes* ? There was a very old practice among ancient people to draw the picture of ancestors (facial features) on stones erected as hero stones. It is from this practice of ancients , the stones which determine the limit of a person's or chiefton's territory got name of *Herme* .In the limit of a warrior's territory his face is engraved in stone so that those who pass by know whose territory is that . It is from this practice Greek God *Hermes* originated.Thus *Budha* the planet which is the nearest to sun and considered son of *Chandra* and *Brihaspathi's* wife and ancestor of *Chandravansi* kings (the limits of *Budha* is from *Chandra* and earth to *Brihaspathi* or Jupiter and to Sun and himself, covering almost entire solar system .) the Greek had their *Hermes* as the stones in a territory of a chieftain.

Alchemy was welldeveloped in India as Kanaada's *vaisheshika* show. The alchemists of Greek times called the spirit of Mercurius as Mercurius Duplex or the twin with two faces (as *Aswins* ).The two faces are like the two *suparna* of veda.One is desire which goes on enjoying worldly things , and the other is one which is satisfied in itself and is *Athmaraama*. Which we follow is our own decision .In Christianity , also

it is the two faces of the fire -one which brings desires and the other which brings desirelessness. In Buddhism also we find the same . *Kaama* and *Viveka* are the two faces of the same and what one follow is absolutely in one's control . Do you run after your biological urges ? Or do you follow the path of wisdom ? That is the decision we ourselves make and no other person is responsible for it . For those who are afraid of looking at the shadow of desire within , it will continue to be a *Satan* or ghost or a guilty consciousness. For one who has seen it as a calm golden ocean of consciousness the shadow is conquered by light and that personality of a yogin is always shown with a *naaga* hood behind in India whether it be *Vishnu, Shiva, Budha* or *Jina* .The shadow comes as man for a woman and as woman for a man and wisdom too comes like that . The four stages of expansion and transformation in growth of a man's *Anima* are :

1 Eve. As a body and organs of woman , and biological sex desires . The one who attracts his sexual desires. A prostitute and symbol of sin. This is the most immature symbol a man can have of a woman .

2.Helen: Romantic and aesthetic beauty in woman. Creativity and arts take importance. Though the sexual dimensions of body is there , the appreciation is mental and arts like architecture, music, dance and literature reach this level.

3.Virgin: The bride of God who has made love into devotion .Virgin Mary, *Kanyaa Parameswary* , *Radha* , *Meera Aandaal* concepts of wife of God and eternal devadaasi and surrendered individual to God.

4.*Sapientia/Shulamite* as in song of Solomon (Jung). This is not a correct simlie I think.Because the song of Solomon do have eros .The fourth stage is *Saraswathi*, *Parasakthi* /*Mookambika* for India .The most pure and sacred which is beyond all .This is the *Thureeya* model of Mother /feminine concept possible only for a very few *Upasaka* of *Srividya* .

*Anima* is a guide for the internal life and karma of men . The messages of *Anima* are experienced as emotions , hopes, fantasy , influences in his life at every stage and awakens creativity of different types in him. Music, literature, paintings, architecture, sciences etc are thus received from mother . The life of a man with four *paada* , is blessed when the *Anima* or feminine power is directly perceived and usually this is in the 4<sup>th</sup> stage of his life he gets a real experience of such a feminine form .And that too is a very rare occurrence possible only to real devotees of *Devi* .*Sankaracharya* had it very early in life .

Once this vision is received, one understands that to think, analyse and enjoy it alone is the truth of one's life . It was in this state of mind *Sankara* wrote *Sudhasindhormadhye Suravitapee...* in *Soundaryalahari*. The divine feminine Goddess who give *sangheetha* and *sahitya* is the *Chandradevi/Somalatha* represented by river Goddess and by trees (*oushadhi /vanaspathi*). Jung also says that for the Islam religion it is Fathima, daughter of the prophet.Suppose it is a woman who is following the path of wisdom. In her, her own *Animus* (male principle) is her most valuable friend . It gives her courage to face life, the concept of reality, wisdom supreme on Athman/self and it is her best Guru . To accept truthfully and in most dharmic way that valuable friendship spiritually is given to both man and woman by God . It is a divine gift to man .

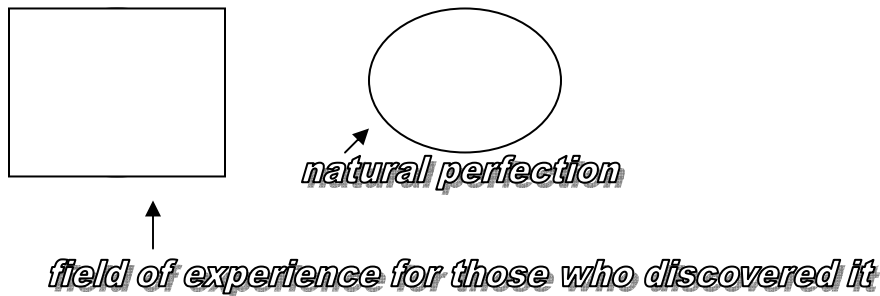
The cosmic person is the *Viswaroopa* . In it there is an *ardhanareesara* aspect of both feminine and masculine (the twin serpent) in the same person as we have seen above from Jung's descriptions. It is a royal , divine merging of the two. Jung's words are : " The psychological opposites –the male and female- uniting in a dream as a divine royal or otherwise distinguished couple".

The merging of *Vasthupurusha* and *Kaalapurusha* in india denotes this union. Jung is never satisfied when he speaks of this union. Only those who have a goal of life beyond eating, drinking and making children out of sexual union gets the vision of the *ardhanareeswara* or cosmic *viswaroopa* . He says the numbers like 4, 8 ,16 etc ( $18 \times 4 = 72$ ) and all multiples of 4 are the symbols of this cosmic *Viswaroopa*. *Sreechakra* , *Mandalas* of various types are symbols of this . This was used by IVC and Harappan people showing the antiquity of union of *Vasthu* and *Kaalapurusha* as a single significant whole . The temple of life is our body which can be round or oval (symbolically) and the body of earth is *chathura* (*chathushka* ) with four sides covered by water . The round and chathura fitting within each other gives a spiral cyclical repetition and *thrikona* or triangles are included in this form . The *sreechakra* is the classical example of mathematical model with *sreeyanthra* as its architectural symbol. And this includes all other *jyamitheeya* or geometrical forms like *panchabhuj*a and *panchabhootha*, *shadbhuj*a and 6<sup>th</sup> dimension of starry universe , octagonal and dodecagonal *anantha* and the *sahasraphana* showing the 1000 petalled lotus as cosmic/biological merging in oneself. The philosopher's stone of alchemists called this as a lion or a twin which rides a lion.(*Simhavahini* as Durga/Simharasi/ Narasimha/Evangelist with form of lion etc). Jung says that a lion and her cub in dream shows one's desire to attain perfection quickly. A twin lion is the symbol of it. If a man dreams of *Simhavahini Durga* means he is in love with that perfectionist idea and wants to spiritually unite with her. For a person who is devotee of *Mookambika* , that woman in dream is Mother , the form of *sangheetha* and *sahitya* giving him her milk . The words Jung said are : Passionately in love with one , to become one with the loved, the only worthwhile goal in one's life " has to be noted. No other thing in life is important for a true *Upasaka* of *Vidya* except merging in her .This is true of any *Upasaka* whether male or female.

#### *Mandala/Chouki /Zodiac :-*

The appearance of a *mandala* of light as a sparkling ocean which is calm and *devi Gayathri* in middle instead of me (as I had seen in my childhood) in 1977 and how it turned my course of life I had written in my autobiography . My family name Nalapat has a special meaning which I knew only very late in life. In *Karnataka Vasthu* it is a *chouki* and in Tamilnad and old Kerala it is *Kolam*(*Golam*) and in cashmere it is *Chouki* drawn in cloths. On four sides there is *Vasthu* and in the middle there is an open quadrangle and the quadratic equations based on it (chathurasreekarana of a circle) in old ancestral houses called *Naalukettu* was known as Nalapat in ancient times. The *Naagara* style temples, the *srichakramandala* , the construction of cosmos or zodiac all reflect this in India. Our biological body also is constructed in this *chakra* model. This is the sacred geometry which Indians followed . From all corners of the cosmos wisdom comes to us . The center of our biological mandala is the self or Athman. The center of the Solar energy field is the sun . To equate them is common practice in Vedic literature. It is not easy to merge with the self –biological and cosmic . One has to do concentrated (*sradha*) *upasana*

(*manana, nidhidhyasana*) for it . *Mandala* is an Indian word which is the nuclear atom of human consciousness and it is impossible to understand it fully according to Jung which is the same idea expressed in Vedas. The cosmic being appear as feminine (Devi) or masculine (Shiva/Vishnu) and as neuter ( *Ardhanareeswara/Brahman/Saraswathi*) in a *mandala* form . The effect of this darsana is internal peace or shanthi. The feeling that life has discovered its meaning, rhythm , order and *shanthi*.



Thus

the symbol of *Anantha* or Zero and the symbol of *Bhoothachathushka* developed .

A person who gets knowledge has to practice *Vinaya* (humbleness) to avoid megalomania. A person who has started to obey ones own *Athman* cannot do unethical things and cannot obey what others (unethical people) ask him/her to do. Therefore naturally an internal distancing happen even from those with whom he/she lives . This distancing is not due to hatred but as a defensive mechanism to protect an ideal perfect state which is very rare and valuable and which may be destroyed by those who have no experience of it. The people with such a character think and speak and do actions only for the best results for entire world and never for selfish ends and they are the *nishkamakarmayogins* of the *Bhagavad Gita*. They live alone not because of any antisocial mentality, but because those around them cannot reach the realms of their thoughts and deeds .They recognize through dreams, symbols and *nimitha* the best friends and faithful people and they will never do anything against those symbols even if the entire world is against receiving those instructions . This sort of *Gurubhakthi* in a person selected by the internal symbols is seen in ancient India . The person/friend recognized through dream symbols is watched or analysed in our *jagrad* state more thoroughly by our differentiating *viveka*. That is only a scientific experiment to ascertain whether our dream symbol was correct or illusion. It is not a lack of belief but a scientific experiment of logical brain. Jung says about this : The dream image may have deluded me , because of my projections; or it might have given me objective information .To find out which is the correct interpretation requires a honest , attentive attitude and careful thought.”.

Two individuals who think and act at same level spiritually when they come in contact and know each other , they do not consider the walls erected by society or other people, but act together for the sake of humanity and welfare of world. Jung says this is essential for welfare of society. The *Guru* and *Shishya* or two friends /two individuals are thus brought together for welfare of all, not by advertisements or media and political propaganda but by the *samanahridayathwa* in mental, spiritual and *dharmik* views. The friendship if it is of this kind will not break. If it is due to some other reasons it will break and there is nothing to be worried about if such a break happens. A lasting friendship for human welfare will never break on mundane influences and only such friendships are worthwhile in life.

Jung's ideas of dream visions and *mandala* and of lasting relationships for human welfare are all derived from India . And this archetypal psychological analysis of human consciousness in *Veda* and *Upanishads* has to be given more serious thought by modern psychologists and scientists who want to know more of their biological and cosmic selves.

*Thaithereeya* says that those *Brahmagnani* who are thoughtful, *Yogayuktha* , free and liberated , without violence and anger , who desire *dharma* and who are eternal seekers of truth are the best to be models but it is difficult to achieve that model state and one should strive to be like that . *Ekagra* (concentrated) *shantha* (calm/peaceful) and *suddha* (pure) they lead a lonely life thinking and doing duties for all , never for themselves.They are the people who have directly perceived and merged with *Satyam Gnanam Anantham* in own *Hridayakasa* (heartspace) .

Name, form and memory as knowledge (*Naamaroopathmakaprakrithy*, cognition and *smrithy*) in three states *Jaagrad,swapna,sushupthi* :--

"Lulled in the countless chambers of the brain

Our thoughts are linked by many a hidden chain;

Awake but one, and Lo! What myriads arise ;

Each stamp its image as the other flies,

Each thrills the seat of sense , that sacred source

When the fine nerves direct their mazy course



( Samuel Rogers 1763-1855)

The state of beta waves in our EEG is the *jagrad* state. To silence those waves to alpha and beyond is the way to control mind and senses and acquire concentration and memory power and thereby intelligence and scholarship. All our experiences depend upon events in our brain . How do we see our world? How do we hear and know it? The awareness of the external and internal space is not representations but re-presentations .

A spatial information in condensed form we call a map. What maps can occur in our brains ? They are the basis of our perception of space-both external and internal . Thus it is subjective to each one of us. And we naturally argue that to know a space the object (body) has to move in it and for moving about we need a map/cartography. Do we have a map like that for moving in our internal space of thoughts? To know ourselves ?

A map is , unlike an image, a tool for conveying information for cognition and action based on it.

A nautical chart is to measure angles and distances between a start point and a finish point in a numerical relation. Suppose the angle is  $135^{\circ}$  by steering southeast , if distance is 2 inches (latitude on vertical scale) there is 2 nautical mile distance. Such an angle measuring device made of a vertebra was found in IVC /Harappan sites showing the accuracy of measurement of angles by Indians in 3500 BC. The point of a image or any tool is not just to have it, but the awareness of how to interpret it, use it and how our ancestor devised it and for what purpose? Only then the study of consciousness of sciences, arts of the ancient man will be known to us, the successors. Only then the language symbols used by the ancestors will be deciphered by us. If we are unable to decipher it we have a terrible drawback in our mindspace that prevents us from knowing our own ancestors and our culture.

Visual awareness of space:-- First comes with sunlight falling on retina and then creating an image there which is transmitted to brain centers for analyzing its name, functions and then to determine the action. Thus it is a *darsana*, *manana* and *kriya* in order.(vision.analysis.function). The technique of functional imaging called fMRI is at present trying to localise the consciousness by mapping such functional states. How the space is re-presented in a symbolic nonspatial form is then analysed with a computer to view it.

Imagine a picture of brain.Under it is the following caption.

I think . Therefore I am. Who thinks? The brain? Or the entire being? Who tells me that brain is the thinker ? Is it brain itself?

We know that there is no consciousness without language. That means the consciousness of the brain resides in an executive controller that keep the brain in orderly systematic (systematic organization of knowledge is called science) way and that tool for science is the language. The message has to come correctly from the language faculty in brain center for us to understand meanings and act accordingly. Then who created the first language for human race is important . Because the availability of a wellorganised language is absolutely necessary for a culture or civilization to communicate effectively and scientifically. Then we know that ancient Indian civilization had this ability. Thus what we are having is a transfer of that faculty through millions of generations of our ancestors.

There is great schism between

1. Consciousness understood from the Anatomy and physiology of the brain which is the realm of neurosciences
2. Writing a compressed programme of it to simulate it by artificial intelligence of a computer.

Years back Helmholtz said that light energy from sun trapped in opsins (pigments) in the pigment layer of retina and pigment absorb light and set a train of long series of chemical reactions later converted to electrical message along nerves to brain. Human brain is comparing the output of just three opsins (three types of cones) to give us a colour vision of endless colours. (The three colours are red, green and blue .)

The *Saamaveda* chants using three *swara* (*udaatha*, *swaritha* and *anudaatha* and then slitting them to seven notes gave us the seven rays/seven flames of fire, seven *swara* of music and seven colours of prism and if we fail to identify these in their seals (IVC ) it is because we have not bothered to study the language they used –The *vedic* language of Sanskrit in which it is given very clearly. The intellectual block is then somewhere in our thought that everything that is Indian is to be disregarded as mythology. Thus not only the *darsana* (Visions/optics) but *sruthi* ( acoustics /listenings) also are in our *smrithi* (memory) processed and stored as wisdom of each individual and society from millions of ancestors and their wisdom.

The process of human perception is as follows:-

All perceptions are first hypotheses. We first select an internal model. Then check it (verify) with available data. The best model is thus that which fits best with the available data. Suppose there are two likely hypothesis that fir the data. Or if there are new data suggesting replacement of an older proven

hypotheses. Then the brain knows how to entertain them in turn. The models of this kind are called generative models that try to generate data.

For example a tidal predictor model. Any tide however complex is composed of a set of simple tides, each being a simple harmonic motion. A people who are exposed to such tides (coastal people) will naturally know the harmonic motion of waves and tides. So the tropical Indian coastal people knowing tides and clockwork monsoons naturally were able to calculate these by observational data. And Indian Astronomers and mathematicians were aware of sines, cosines and the simple harmonics in astronomy and in string and percussion instruments at least before IVC/Harappan period as evidences show which is not surprising from the geographic location of Indian subcontinent.

How a singer produce so many data -that is the music-with his vocal cord? Rather, what a singer does to generate that much of data as the innumerable raagaas? That was a question which I was trying to answer from childhood. The task is like calculating the number of stars in night sky, the number of sandgrains in seashore etc. A better example is like calculating from the ripples and waves in the watersurface of a busy harbour, how many boats are there? Only if we construct a model harbour where we can move our own boats (and do not allow any more number of boats) to generate the number of waves and ripples and then calculate it with the number of boats which we have controlled. This is a controlled trial. Even then we may not get the value right. We can reduce our errors if we have a right measurement tool. That is fix that the boats we use have a fixed length (say not more than 100 meter) and no boat should do more than five knots. Then we will generate a controlled model. This will be a generative model for sound pressure waves also. If we run this model of sound pressure wave backwards you can interpret someone else's speech /or music.

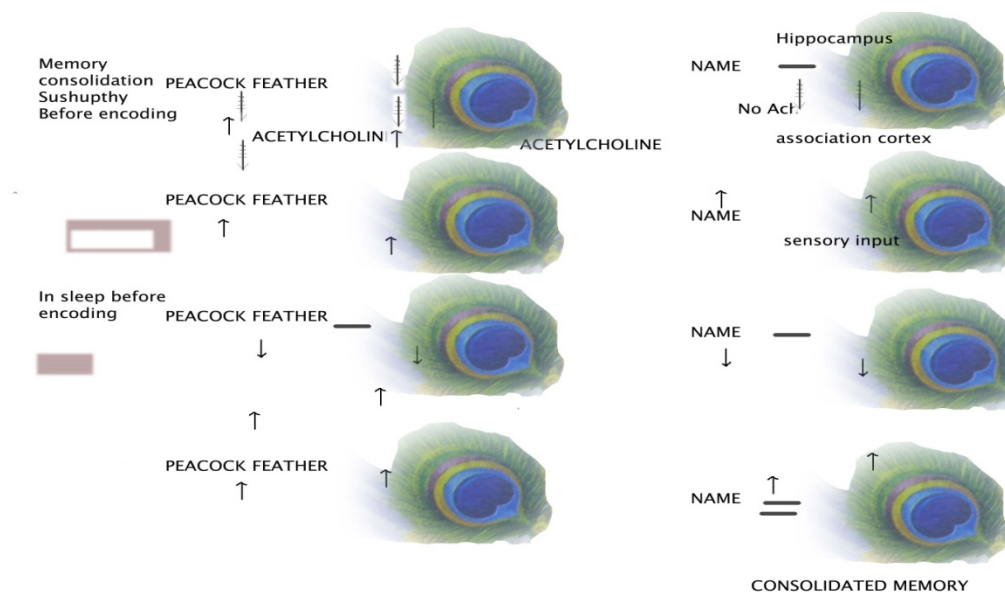
That is why the ancients made three *swara* (*udatha, anudatha, swaritha*) from which the octave and the 22 sruthi with affixed length and measurement for each. Then when we do research on Music therapy, to be more specific we have to make sure that we do use a controlled parameter. If vocal, the minimum instruments to avoid disturbances and bias in the research. Like that we can control each of the parameters of music.

The same principle of reverse movement mentioned for generative model of sound pressure waves works in our neuronal networks. All speech /sound recognition programmes of our brain work by filling a probabilistic generative model. So if you are recognizing the voice and singing pattern of a Yesudas or Raffi, or Latha or Suseela, it is because this generative model is at work in your brain without any conscious effort on your part. The brain and neuronal channels is doing that for us.

There are 600 muscles in our body. Each undergo at least one contraction and one relaxation in a life time. Assuming that there are  $600^2$  possibilities just for muscle action that is more than all the millions of stars in our universe. So our brain is a very interesting dynamic storehouse of endless possibilities and we can't predict its behavior as we do with that of a computer.

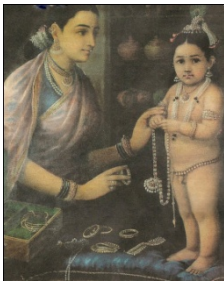
Some people have difficulty in recognizing voices . Others have difficulty in recognizing faces or names attached to faces. In brain damage the Prosopagnosia (that is a jargon medical word for losing ability to recognize face) develops. fMRI shows damage to fusiform face area and inferior occipital gyrus in such patients. These are the areas where more activity is seen when we look at a form or shape. I remember a traumatic head injury in neurosurgery ward. The client was a college student. After three days in the ward, the student suddenly started to speak incoherently about Shakespeare and his literature. "Shakespeare was born in Avon ...." he will start saying as soon as the neurosurgeon enters the ward. The parents were worried about the incoherent speech. But the neurosurgeon quite confidently said that the boy will come round within a day or two and he is showing signs of improvement. How did the neurosurgeon's brain make that prediction? The Neurosurgeon had a resemblance to Shakespeare and he was called (in his Medical college student days) by close friends as Shakespeare Kumar, my husband Dr Udayabhanu told me. So, he knew that the boy is able to recognize a form/shape and correlate it with a name –this time that of Shakespeare . The clinical judgement and prediction of the neurosurgeon did not fail.

It is not the face alone that is processed at the centers. If a farmer has the area destroyed he will lose the ability to identify his crops, his sheep, cattle etc. If an ornithologist, he may not be able to recognize his birds . So it is actually an area where practice has made identifying and naming and categorizing (classification) perfect . Einstein had practiced by imagining himself as sitting on a beam of light. (pp139 Michel Morgan .The space between our ears .2003. Weidenfeld and Nicolson). That is how Einstein imagined a spacetime continuum and discovered his mindspace. So we have to know the power of visualization of mindspace and positive thoughts in wellbeing .



The picture shows how the encoding happens with acetyl choline and how short and long term memories of a form and a name are thus consolidated in an individual brain . The consolidation of archetypal memories associated with peacock feather in India is related to Krishna . The individual and cultural memories of a people are thus to be preserved for them to know themselves and to live in peace with themselves and

with others . The *swapnanidra* (REM sleep) and dreamless sleep (*sushupthi*) and the *Samadhi* (meditation ) waves are compared in all *Upanishads* and in *Gita* and *yogasasthra* (and figures of a yogin in IVC /Harappan seals also shows that this science had been popular even at that time (BC 3500) in



India. The period of Krishna's life and the beginning of Kaliyuga in India (BC 3102) corresponds to the IVC/Harappan times. Vedavyasa , who compiled the Vedas was an older contemporary of Krishna.

## Chapter 17

### Psychoacoustics

The study of perception of sound is called psychoacoustics. The sound is processed by ears and brain and it is a complex process and is subjective in each and every individual .Because of this its study is also extremely difficult.

Hearing sound, Listening to music, understanding it and comprehension of it and appreciation of it are all different in each individual . Musicians are interested in two aspects of psychoacoustics: Intensity and pitch. They are interested in Masking effects which are of use in designing sound compression techniques. (like MP3 formats).

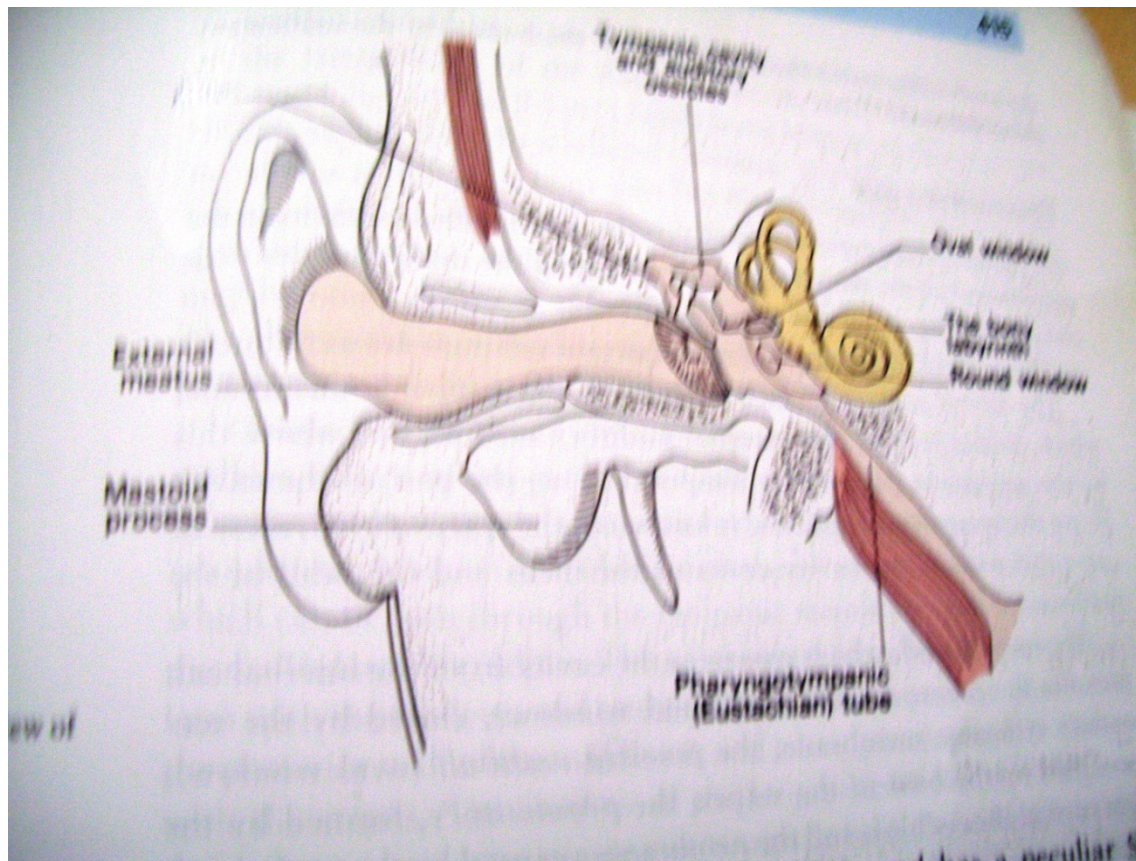
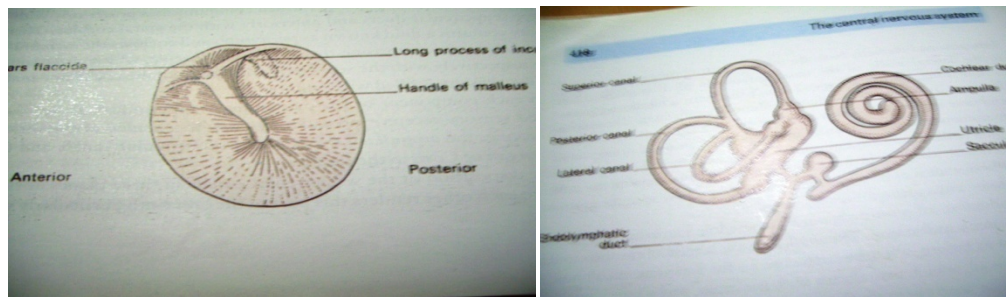
The sound intensity  $L_1$  , expressed in decibels is a physical measurement of acoustic pressure and it does not coincide with our sensation of sound intensity referred to as loudness. Our range of hearing of frequencies is limited. Even inside this interval( 20 Hz to 20 KHz ) for a given decibel level , loudness vary depending on frequency. Hearing has a sensitivity maximum between 3000 and 4000.Hz. There are two units of loudness to render subjectivity of our hearing : The phon and the sone. The very lowpitched and the very high pitched sounds require more energy to be perceived with the same level of loudness. The phon is related to decibel by relation  $x\text{dB} = x \text{ phons}$  at 1000 Hz and by Fletcher contours (ears max sensitivity between 3000-4000 Hz). It fits the measurement of sound perception well in the sense that two pure sounds with different frequencies but same measurement in phons are perceived to be at same sound level. It does not give any information at phon level needed for a sound to be perceived as twice as loud as another sound. Fechner's law tells us that perception of intensity follows a logarithmic law .Experiments on 1000 Hz pure sounds show on average subjects find loudness doubled when sound intensity increase by dB, which corresponds to multiplying the acoustic pressure by  $\sqrt{10} \approx 3.16$ . This is valid when weaker sound is above 40 dB. Below 40 dB the gap that leads to a twofold sensation steadily grows from 3 -10 dB.

It is precisely this relation that the second unit of loudness conveys. International agreement reference point set pure 1000 Hz sound with intensity 40dB and has attributed it with loudness of 1 sone. Sound level in sone is denoted as N.

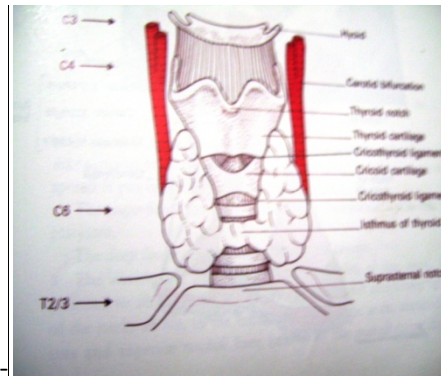
Why music cannot be prescribed without assessing individual preferences as well as abilities to process and produce music ? Because the ear, the brain, the larynx and vocal cord of human beings make it different both for production and perception of music to be the same in all people. See the pictures of these three organs below.

The ear :-

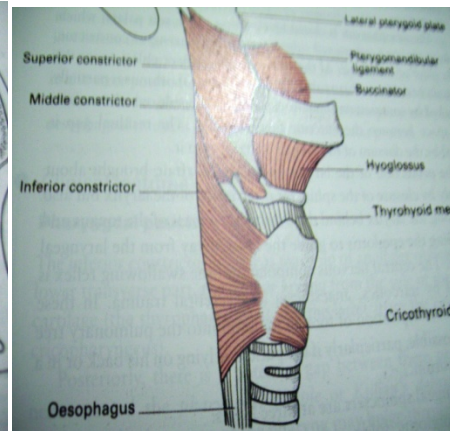
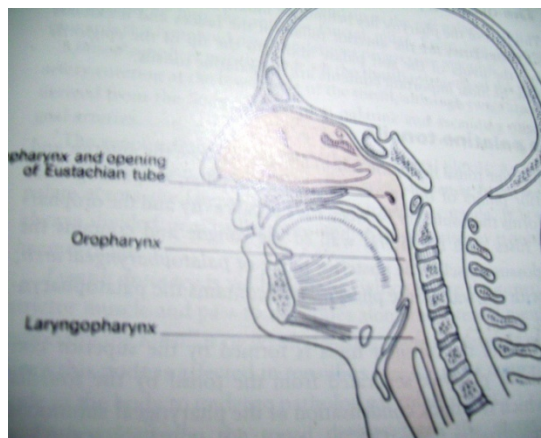
Structure :- The tympanic membrane, the canals (internal, external and middle with its structures) and the auditory nerve in each individual functions according to a unique way due to various factors..

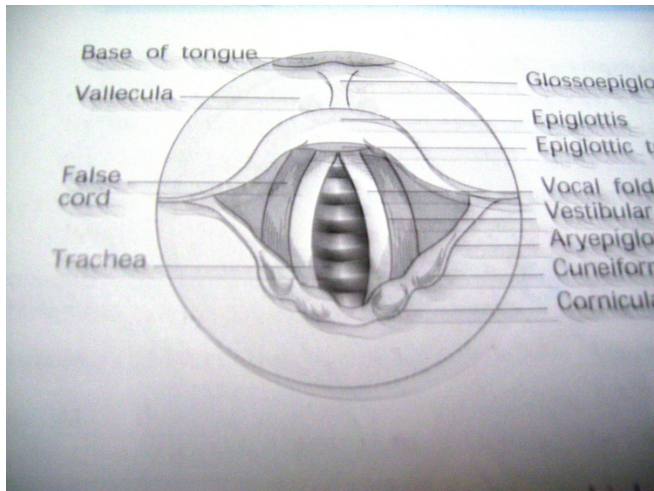




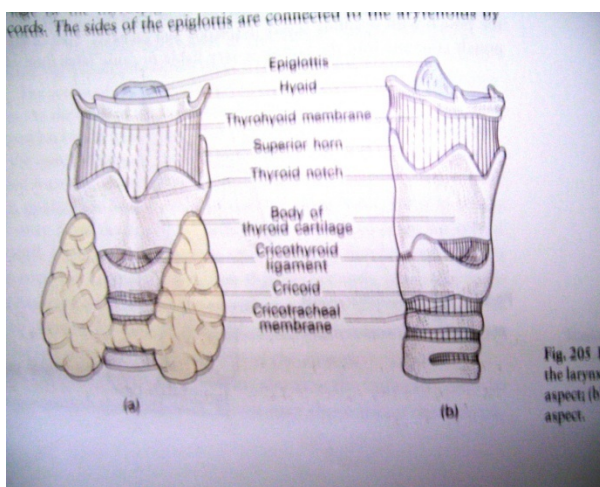
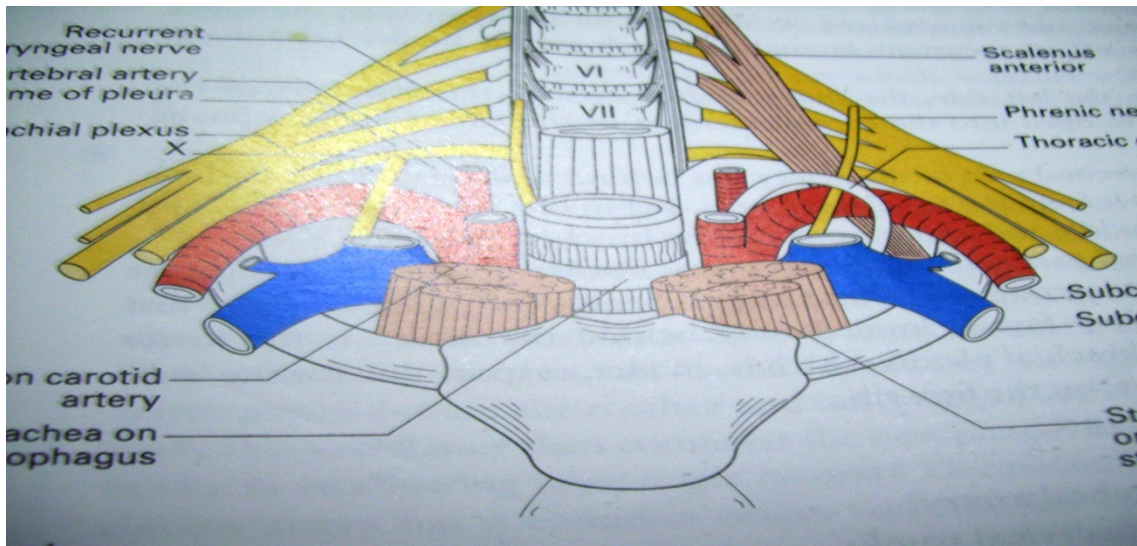


The larynx and pharynx of singer:-





In Sanskrit text (*Upanishad*) this part is called *Indrayoni* due to its resemblance to a *yonī* or womb.





The brain of both singer and listener:-



Pitch varies with logarithm of frequency. And the gap we perceive between a 100 -200 & a 200-400 Hz sound is same . This is the octave interval .This is equivalent to a twofold increase in frequency. For higher frequencies this does not apply. A pure 6000 Hz sound seems much lower than the octave of a pure 3000 Hz sound.

An acoustic illusion or *Maaya* is that even though each note is higher than the previous one we end up with the same note six notes later , exactly as a closed loop staircase in west and a closed loop *kundali* (serpent ) that eats its own tail in ancient India. This paradox is represented in IVC Harappan scripts onwards in India. A continuous perpetually ascending sound is based on the same idea and is called a glissando.

When two or more sounds are produced together, only one is perceived by listener as *Yajnavalkya* describe to *Maithreyi* , the other is masked. There is no point in keeping what the listener does not perceive. For certain sounds , the masked sounds cannot be heard , but listener can perceive the differential sound produced by the beat between the two sounds. Even autistic and mentally deprived children do perceive this. If the masked sound has a frequency of 1200 Hz and intensity 60 dB the differential sound heard has frequency of  $1200-100=200$  Hz. The shape of mask vary with pitch and intensity of masking sound.Masking threshold has clear dyssymetry. An intense lowpitched sound masks faint highpitched sound , whereas an intense high pitched sound will have difficulty in masking a lowpitched sound. The reason is the frequency localization. To sing in a perpetually ascending scale , any classical *raaga* is a difficult task (as is done in the film *sindhubhairavi* with *kalyani raaga*) .

The challenge is great for a musician to sing all *melakartha* with all possible permutation and commutations , and for such a person who has mastery over all these , nothing is impossible to achieve

and the listener who is seriously listening and appreciating talent will notice such features in a singer and assess him/her accordingly . It is not just enjoying and timepass but ardent love for music which makes us a good *rasika* and good perceiver of music and musical talent . This is the listener oriented approach which is highly subjective but which really matters for each individual in keeping oneself healthy physically , mentally and intellectually throughout life.

Individual systematic differences and random differences make the individual uniqueness.

A similar gene, a similar brain due to a similar gene etc are the systematic differences in which a researcher does his research to find out reasons for our differences, uniqueness and our similarities too. Our random experiences which influence us to develop our personality , our sense of a unique self, our worldview, our personalized meanings in life are very important for each of us and in this a biomedical researcher is not much interested. The random is important for a music therapist . This random uniqueness does not imply the absence of operation of the systematic laws of genetics or of nature. But it does imply the impossibility of accounting for each and every personality difference in terms of the precision of the scientific tools currently available (pp 519.Philip J Corr .2006.Blackwell publishing.Understanding Biological psychology)

Our basic emotional facial expressions were defined and enacted centuries and millennia back by the *Natyasastra* of India . In Europe it was Darwin who first showed that emotion could be measured objectively but in India this was measured and demonstrated millennia back and still it lives as a living tradition . The economics and politics of emotion is that a device that exert control over our psychological resources creates fear complex and the attention is first focused on threat. All other cognitive activity halts. Resources allocated to processing the nature of threat. This leads to a negative hedonic state.

If on the other hand we receive a positive emotion of love that swamps the entire emotional system and thus the physiological system with a positive hedonic tone .Everyday *jagrad* state is a mixed economy of both with a low level emotion and high level cognitive action which gives a flexibility. A command economy state or model where resources are directed to meeting immediate challenge with either favourable or unfavourable results occur when there is a danger/challenge perceived. Affectively disordered people are in a command economy state.

Attention, memory , problem solving (cognition) is triggered by environment (threat/promise) and for a positive emotional response to happen one needs a balance. That is one needs a balanced mind and not a free market state of mind.

Loss of a loved one and verbal insults and diseases in family cause emotions of a general doomsday strategy to be activated automatically. So too poverty and struggles in life.

Two possibilities are inferred from this by the sufferer so that he/she gets a emotional relief.

1. Individuals reap consequences of their own behaviour either this birth or previous births and this reduce our genetic fitness (as we are then born in a lower strata /like animal plant kingdom even ) This *karmasidhantha* helps people to make their karma better and evolve into better personalities.

2. This is also a signal to teach others and to show a model to others about the cause and effect theory of karma which says to every action there is an equal and opposite reaction on earth. (Newton's law).

If a person can control emotions and despair and keep a balanced mind, then disorders of anxiety, tension and stress would not happen. The theory of balancing the mind by yoga, by music, by a lifestyle of unselfish action (*nishkaamakarma*) etc were thus devised for a balanced mind which keeps a balanced body and brain and neuropsychological function.

#### OUR DEFENSIVE HIERARCHY

Anterior cingulate gyrus-discriminated avoidance

Amygdala-Phobias, fears and avoidance

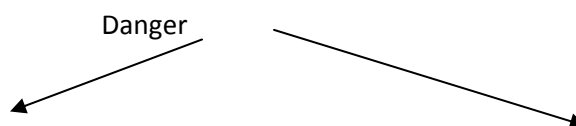
Amygdala-Phobias and arousals

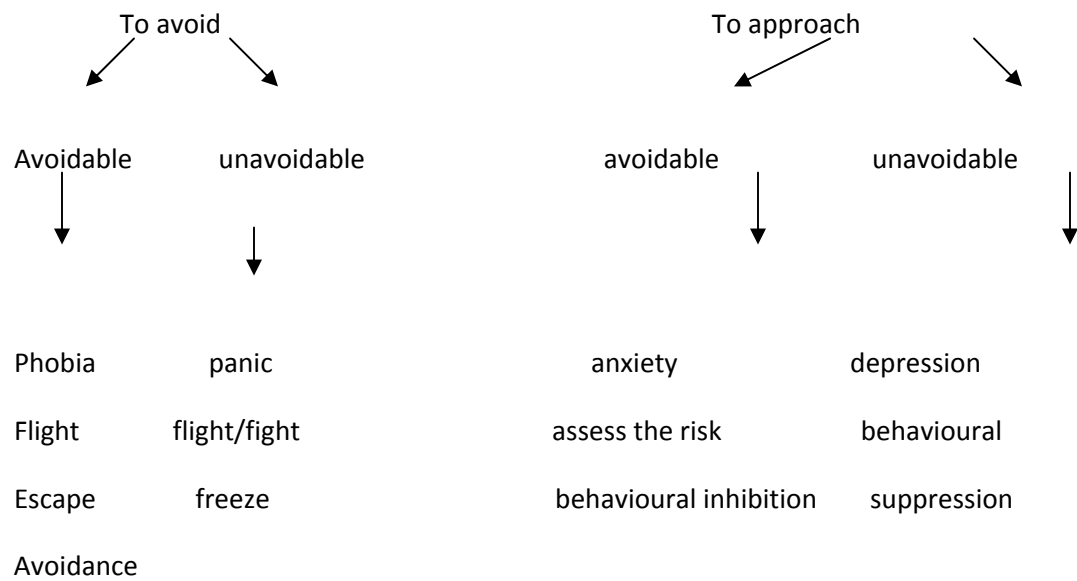
Medial hypothalamus-Directed escape, Phobias

PAG Undirected escape explode freeze

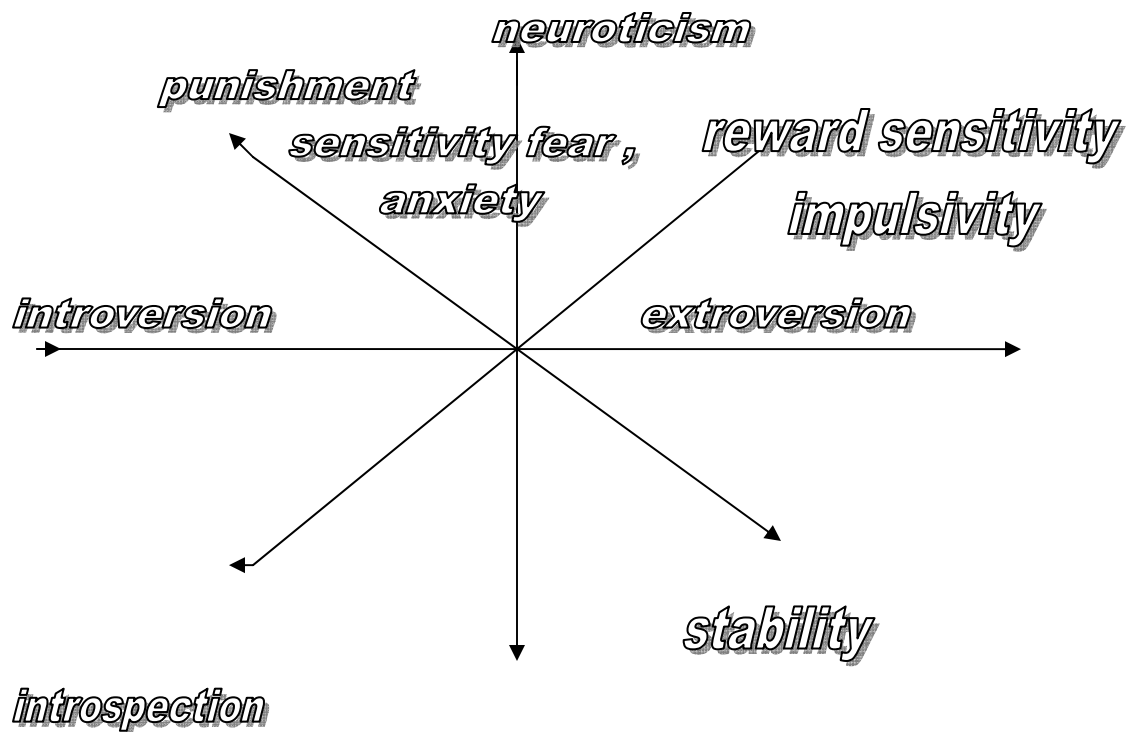
Anterior cingulate gyrus: Discriminated avoidance  
amygdala: Phobias and avoidance  
amygdala: Phobias and arousal  
medial hypothalamus: Directed escape  
phobias  
PAG: Undirected escape, explode, freeze,

Avoid –approach defense (McNaughtan and Corr 2004 pp 543 .Philip Corr):-





Revised E/N rotation (E=extroversion N=Neuroticism )



Until the nineties scientists thought consciousness as the problem of of the philosophers and were not interested in it. But modern neuroscience has changed this view . The subjective experiences which one person alone experience and the objective science data which is a third person perspective from a scientist point of view are now being utilized in combination for knowing the complex functioning of the human brain . However much a person does brainmapping of my physical brain, still my personal individual experiences or my jagrad , swapna sushupthi experiences and its emotional state that computer or the person who maps my brain cannot experience or reproduce in his/her life or system and that is my as well as every body's uniqueness . This is what the *Yoga* and *Upanishadic* traditions are discussing for millennia in a very advanced thought experiment and music and *sabdasasthra* are the tools with which the consciousness was studied, and recorded and preserved for posterities . And it is not different from Indian astrophysics and other systems of arts and sciences and there is a integrated approach and this is developed into a lifestyle which is a culture and still preserved. If we are negating that as a religion , we as a nation , is doomed and our intelligentia has to understand the gravity of the problem from a scientific and cultural point and not from religion or myths .

Human consciousness is a product of evolution and is functional serving as an adaptive model and is not a mere epiphenomenon. It is a product of brain (physiological monism) and came late so that it cannot have a causal influence on the process it represents. The consciousness and perception itself is a construction .The causal closure of all the external physical worlds leads to theories of consciousness. It

has to be incorporated into the neuropsychological concepts of both scientists and nonscientists/artists to know it wholistically.

Ref:

1 Philip J Corr .2006.Blackwell publishing.Understanding Biological psychology pp 519. 2 McNaughtan and Corr 2004 pp 543 . Philip Corr ( Avoid –approach defence)

### Chapter 18:Solving challenges for a healthy survival

#### Music Therapy:-

Mahathma Gandhi said: Truth and love Is *Ahimsa* .They are the only things that count.

Science is a human activity. Therefore to think that science need not have virtues and values and should be separated from ethics is a misunderstanding. Science depends upon observation, enquiry, recording data in orderly fashion, and thus after analysis and discussion (using both own experiences and the experiences of others as references) systematically arranging knowledge and then believing them. When the same procedure is done for self-enquiry and self acquaintance of total psychological movement of our own mind-brain system in action, that also is science. This process leads us to a self-surrender of ego which leads to a perception of wholeness of life . The benevolent nature of our intellect and intuition together views the situation, and guides us to harmony, justice, love and compassion.

Life, if considered as a stream of river, on one shore we have modern technological development, chaos and entropy created by erosion of values, unequal economical planning and its disasters. The other shore has peace, harmony, justice, love, compassion, surrender of ego and selfishness, and as Gandhi said truth and Ahimsa. A balance of these have to be struck by the 21<sup>st</sup> century human being. This is a great challenge humanity is taking up at present.

The “ Value, Education, peace and modern physics –USA Townsend letters for Doctors April 1992 pp 281-83 last paragraph reads thus:-“The breakthrough in mind-brain research proposed the first model of human psyche .Let this model be examined by world physicists, scientists, physiologists, psychologists, social scientists , educators and mystics. Such a dialogue will lead to a second model of the human psyche. This is the only way to “heal the planet”and”healing ourselves” which is called the Humanist Technology. This will save humanity from annihilation”.

Arthur Schopenhauer:-All truth passes through three stages. First it is ridiculed. Second it is vehemently opposed. Third it is accepted as being self-evident.”

When I started a process of Grand Unification of all sciences and arts and sciences and the integration of both west and east (science, and philosophies) I was made to remember the famous words of Arthur Schopenhauer because I was passing through the first two stages which he mentioned . My unification is through the golden thread of music for peace and self-healing which will heal all separatisms in the long run.

Challenges:

1. Restructuring science . The outer objective field and inner subjective field (physics and psyche) is a single dynamic harmonious flow. They are interrelated, interpenetrated and inseparable. The objective sciences have to restructure themselves to take subjective sciences in its fold . Because true science is the dynamic interplay of objective as well as subjective sciences. It explores all co-ordinate systems, to borrow the words of Einstein, of our mind spectrum. It implies to investigate the unit of perception, the cartography of a unified inner space, transcending all psychological imbalances, the fields of human self-awareness called realm of consciousness and his being the subject and not the object.
2. Holistic education: This is for the cultivation of the total human being. The educating the educator introduces the psychodynamics of the mind-brain system in science faculty and transpersonal psychology in art faculty at all levels. This should lead to perception of wholeness.
3. Valuebased education:-When the external perceptual –conceptual image blurs and the internal perceptual image is activated, it gives us values. Values are not mere subjective nature of thoughts .Without cultivating values education becomes a farce.
4. Integration:-The reasoning logical thinking mode and the creative value perception mode have to be integrated in human personality for character building. We have to nourish intuition –insight mode and explain it at the intellectual level. This will lead to integration of the two hemispherical functions of brain and integration of all arts and sciences.
5. Holistic health: The subjective is verified at an objective science level . The cost of medical treatment in the Developed countries, its lack of cost-effectiveness, the new diseases developing as a challenge to modern medicine causing panic among people, the stress-related major diseases (including cardiac disease, digestive disorders and cancer)on the increase etc have given awareness to levels of quantum healing and holistic health .How to regenerate and self-fortify and self-heal our own immune system (instead of killing the outside forces as pathogens) and heal the mind –brain-body complex as a single whole (by psycho-neuro-immunology principles) has become more important now .6. Ecological problems and how to solve them is another major challenge .



It is detrimental to life on earth and is causing major health problems and effective handling of it is mandatory for existence of our nature and its life forms in a healthy co-existence.

7. Violence is another problem we see around. There are three types of violence. The physical, mental, and intellectual level violence. All violence and crime is an expression of the inner fragmentation and separatisms. It is the sign of suppressed psychological imbalance of the person who commit it and hence of a society.

We have a fragmentary Reductionistic society. The social sciences have several branches like economics, politics, social laws etc. The healing sciences have several branches –western and eastern-foreign and indigenous to be integrated. Similarly there are opposing ideas of religions which has to be integrated. The inner dynamic revolution is never violent but nonviolent as Gandhi pointed out. This inner revolution which is a psychological transformation from violence to nonviolence has to happen by proper educational system innovations which requires integration, not separatist slogans.

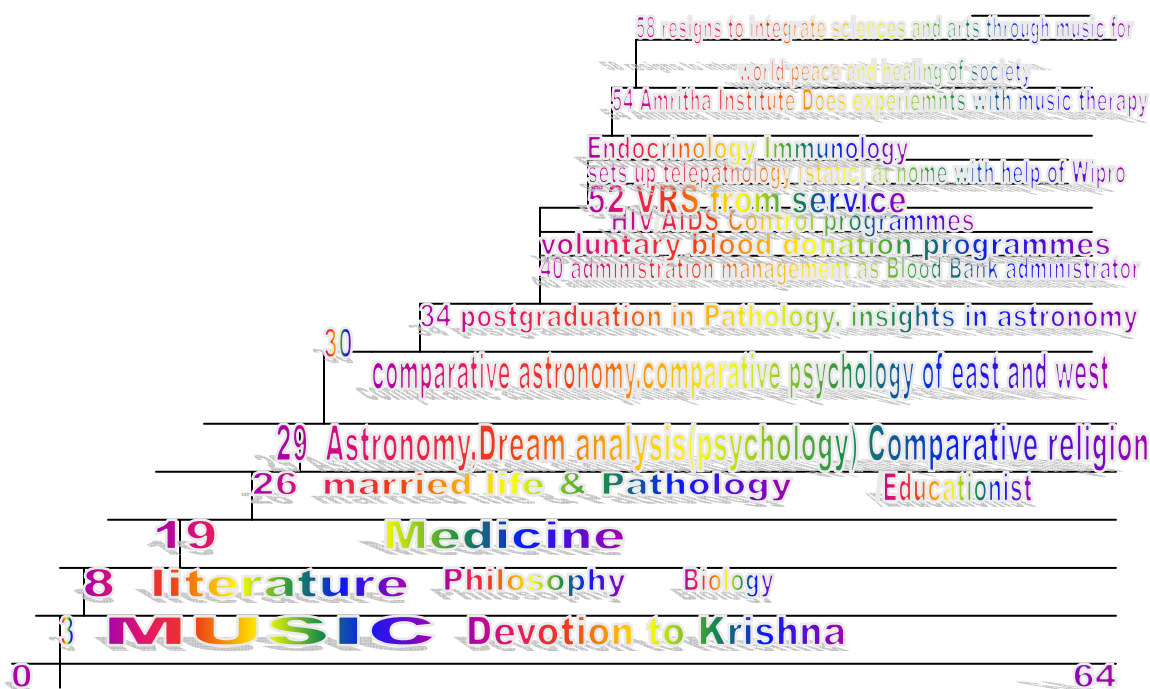
8. Peace: Peace is related to inner space of human beings. It is a state of mind that does not create entropy. chaos/stress to the system. For this to achieve we need an inner freedom. *Shaanthi* is the word used by ancient Indians for peace. The search for shanthi in oneself and thus create it in society for the prosperity of entire living things is the oldest way to know a new dimension of human consciousness and remains to be so.

All these challenges have to be met by a method which is universally applicable. That method is my music therapy. It is the golden thread on which all the pearls, corals, and jewels of sciences, arts and ideologies can be strewn in a beautiful integrated way so that physical, mental, intellectual and spiritual health can be achieved for a better future.

### Teaching self-healing

Self-help is a self-healing regime to be taught to each individual. It is not making a shoe and asking everyone to fit into that shoe. That is the most important thing a Music Therapist should remember when he/she approach any individual. Do not think that you can generalize as on Biomedical data standards and prescribe a medicine/music for all patients alike as a common regime of Chemotherapy for all cancer patients of the same type. Music has more creative and more varied expressions just as there are endless biodiverse forms of life on earth and each one of us has to find out our own fitting shoe and what Music therapist does is to help in finding out the correct size and the facilitation of the self-healing process. The one-size-fits-all regimes, the common diet plans, the same fitness plans for all, and the same raaga for all with same disease are all thus discarded in a correct music therapy approach.

What I keep before you in the form of a book is a fruit of research spanning over an entire lifetime :



The ladder starts at zero hour (birth) and the base is as a music Lover and Lover/devotee of Krishna and the *Gnana*, *Bhakthy* and *Karma* are all based on that first beginning or stepping stone. The people whom I have met are from all sorts of backgrounds. With different sorts of experiences and different world views and likings for music of different sorts which reflects their personality. They are doctors, teachers, astronomers, musicians, friends, specialists in various jobs, sciences and arts, some with disease and some without. Symptoms ranging from unexplained fatigue, a crippling low self-esteem and inferiority complex, inability to concentrate on work and studies, anxiety over a multitude of things (each have a different reason for anxiety) dissatisfied with themselves, and with the world and desirous of leaving the painful past and to get into a new horizon of hope and positive thoughts and feel free to pursue what they would love to do but tied by a 100 ties (domestic/professional) which they cannot break through. They try to cope well with every circumstance in life and some succeeded and others become stressed and tense and fall prey to numerous diseases induced by stress. Some have lost all hope of regaining the positive health and others still do have hopes. Some are too reckless and do not care to listen to positive advise and go their own way until it is too late for repair. And each has some sort of a self-help programme to keep them going, which they have devised themselves, some with efficiency and good results some without that much efficiency and hence not with much positive results. It is this group of individuals we can help with a self-help programme of music which is universal. The client and the therapist have to achieve it together as two friends, as two equal teammates. There is no one-way help in self-help programmes. It is always awakening the spirit of enthusiasm for self-healing

which lurks hidden in each individual and which balances positively once awakened . This balance is what is called *Chakra* Balancing, or balancing of *thriguna/thridosha* , *yin/yan* etc in ancient eastern programmes of self-healing.

Here are some suggestions for self-healing which with some case histories (names not true for sake of client privacy) may help you to heal yourself .These are only suggestions for self-healing.The real work is with you yourself. Each individual has to create a self-help manual of therapy for oneself .Choose only the suggestions that appeal to you and your life problems and discard the others , because in a book one has to give suggestions for different types of personalities and illnesses . Test and modify the effects of suggestions day by day so that by a trial and error method you yourself will find out the best suitable method of healing for you .

I will start with a child whom I knew from childhood. Her grandmother told her as she grew up that her first spoken word was *Njan* ( I ) which is a difficult word for a child .While all her siblings started either with *Unni* (in third person) or *Inni* which are comparatively easier words picked form what the elders called them , this girl spoke from an adult vocabulary of ancient Dravidian for I/Me as *Njan* which incidentally is also the root for *Gnaana* and for *Njayiru* or Sun . That was a surprise for her grandmother but her brother told her that it is not surprising because this girl is born with a mission . This child learned everything that she could come across , with an enthusiasm for learning and teaching . And her self-help regimes of learning made her a scholar . You know that that girl was none other than me . The happiness and self-confidence come from internal source for any human being and not from external is the first lesson in self-help regime. We need not go to the extremes of what I have spoken about my experience . The fact is that we can solve our own problems without others help. A woman I know grows her own vegetables, grains, animal husbandry and milking and she gives whey and water to every school child who comes to her home during leisure hours , sometimes with mangoes, and other fruits grown there . And she has no children of her own but she doesn't feel lonely with the love the children around and her day to day work which is useful for her own selfsufficient existence as well as for the pleasure and company of the children . The link between solving our own problems by self-help and the self confidence and happiness is very strong . The converse also is true. If problems accrue and we cant solve them that takes away happiness as well as self-confidence . Low self esteem makes us vulnerable to stress and strain of life . For this one has to achieve a positive balance and music is the best for that purpose.

We live in a world of information overload and speedy scientific advancement which everyone cannot cope with without being stressed. In fact the IT boom has made several adjustment problems among teenage and young adult population due to this fast life of information boom . Adjustment problems are more in such a population who consider individual above society . High individualism has always been competitive and competition brings more stress and more chances of failures in life and inability to cope with it . In such states also the techniques of self-healing will stand at good stead for people . Many people are now living alone due to various reasons . The stress of a lonely life is taken away by a positive self-help regime . Apart from these problems of society , there are individualistic health problems

affecting various organs and systems and creating socioeconomic problems to family and healthcare facilities etc . In such situations also this self-healing system with support from healthcare institutions and from educational institutions can do lot of help . And in professional stress this help makes lot of difference in productivity and creativity .

#### Case History 1

Shakunthala aged 50 had sleeplessness for several months. When she goes to sleep she wakes up suddenly and feel she is breathless . By chronic sleeplessness she feels tired every day morning and unable to cope with her day to day duties. This makes her very anxious and tense. Sometimes even depressed . She becomes fidgety because she cant listen carefully to what others ask her to do . There is a lack of attention in her part .

This is a case of insomnia or sleeplessness . A person feeling that she/he is unable to get enough sleep despite having enough time for sleep , and having negative symptoms of chronic sleeplessness is having Insomnia .

Why is sleep so necessary for a human being ? Because during the *Jagrad* or awakened state numerous external stimuli come to our brain and our brain is in a state of constantly being bombarded state which on EEG will be recorded as beta waves which are jumbled up and disorderly .The brain needs rest for its proper work to resume and attention, concentration and memory power to be regained. Sleep is that balancing mechanism which nature has offered us . The normal sleping pattern is to work during day and sleep at night and thus a nocturnal sleep rhythm pattern is there for human beings. Usually an adult sleeps 7 ½ to 8 hours and gets 16 hours of working hours for the brain . A younger child needs more sleep because it needs more concentration and attention for learning skills . A newborn baby needs 16 hours sleep and only 8 hours of awakened state . A school-going child needs 16 hours a day . A 70 or more year old may need only 6 hours or less of sleep a day.

Sleep is cyclical and not at one stretch . Each sleep cycle is 1 ½ to 2 hours long and this cycle is consistent in each individual's life once a cycle is established.

Conditions associated with insomnia are

- Any physical discomforts, pains, indigestions, menopause, sleep apnoea (in which large airways contract as you fall asleep)
- Stimulants and medications cola, chocolate drinks, pain killers, caffeine and nicotine and theophylline in your drinks several slim tablets, decongestants and antidepressants and steroids , beta blockers , amphetamines etc which the doctor might have prescribed to you for some other disorder
- Anxiety , phobias, low moods and depressions , obsessions and compulsions (OCD)
- Traumas causing posttraumatic stress disorder (PTSD) causing flashback nightmares of what had happened as a shock in previous life
- ADHD attention deficit hyperactivity disorders

- When you face a life-changing event in life . May be an exam, a house being built or a death in family , inability to repay a doubt etc It could be a cancer or any other illness which has a heavy stress on the person as well as the family .
- Once the sleeplessness started , it may go on to become a habit , even after the cause is removed and taken care of .

The psychologist may ask you what caused the event when you report the sleeplessness but by that time most probably you would have forgotten the triggering event . The best thing is to have a baseline sleep diary of oneself. Take a notebook .Write down the date and time for a minimum of one month and observe your own normal sleep rhythm

.Enter the usual time you go to bed.

Event	At what time	Length of time	Why you woke up ?  Only if relevant you need write this
Into bed			
Fell asleep			
Woke			
Fell asleep again			
Woke			
Fell asleep again			
Woke			
Fell asleep again			
Woke			
Fell asleep again			
Got up in morning			
Total sleeptime			
And sleep cycle			

If you have a normal sleep rhythm which is suitable for you and if you have a total sleeptime for your age and conditions, then there is no need to worry about insomnia at all. And by observing just one month you have known your own rhythm and you can adjust it with the best music which keeps you get a nice sleep. It is preferably a *Raaga* that induce sleep and therefore soft and melodious. Which *raga or whose voice* is best for you is actually your own choice and only if your choice fails you need help from others.

Why you should know your sleep cycles ?

It is during the rhythmic sleep cycles your brain heals all your injuries, traumas and it gives you dreams of healing. Usually we are awakened in every  $1\frac{1}{2}$  to 2 hours but we go to sleep within a minute again and we do not even know that we were awake for a minute. When you start to keep a diary this may vary slightly, because a person getting up and writing something and again going to sleep may take a few minutes. May be 15 or even 20 minutes instead of usual 2 minutes. Therefore, if you can understand your sleep cycle rhythm with just one week of observation, do away with the recording. Only those people who cannot do it in one week need record for one month. I would even prefer not to record at all (though recording is advocated by modern researches) and just to have a knowledge of what is going on with our night rhythm in mind by cognition (as if a *veda* which is not written down but just listened to).

Suppose the intervals you get are 3, 7, 5, 6 and 9. Since our usual cycle is between

$1\frac{1}{2}$  to 2 and all these are divisible by  $1\frac{1}{2}$ , you have a sleep cycle rhythm of  $1\frac{1}{2}$ . If it is not that regular most probably the rhythm is 2 for you. Whether you record or not, your total sleeptime and your feeling of whether you have slept well and enough are better judges for you to rely upon and only when you suspect that you have lost sleep you need write a basal diary for finding out whether you are returning to your normal rhythm is another better option.

What I do is to put a MP3 when I start to sleep and go to sleep. I know my rhythm because invariably I hear the same song when I enter my intervals (showing that it is very regular and rhythmic) and go to sleep immediately unless I get up and drink some water before I lie down to sleep again in which case just  $\frac{1}{2}$  a song is needed for me to go back to sleep. This is a better method than taking a book and writing a diary as the psychologists advice you to do to keep a sleep rhythm diary chart of basal sleep habits.

The next thing for self help is to take time for relaxation. Sleeplessness makes you tense and this needs relaxation.

1 Lie down in a *shavasana* position.

2 Close eyes.

3. Breathe deeply and evenly and slowly

4.Repeat your favourite *manthra* , and if possible your most cherished Vision . The deity, nature or a best friend, Guru , Father/mother or any positive thought which you can visualize vividly and feel relaxed

5 .During this exercise keep a soft melodious smoothening music which gives your brain alpha waves so that you get a better visualization of music and a better relaxation of both body, mind and intellect .You may fall asleep but it does not matter because you need sleep and relaxation .

For relaxation it is better to use the music which you love most-melodies that bring the most positive and happy memories which one cherishes. This has a individual characteristic and emotional attachment to the listener and work well for relaxation, than music which is not emotionally linked to individual.

If you are emotionally linked to poetry and not to music you can use recorded poetry also . Bhajans , popular music of any kind the individual likes but with a soft smoothening melodious tone is to be selected . Even in your familiar music there has to be a selection for relaxation techniques.

Whatever is thus selected , one has make it a routine regular practice for relaxation at regular times . The best time is probably in late after noon after coming home from your work in case of adults . If you have work at home when you reach there and several small kids to look after , take a few minutes at workplace itself before you leave it , in a quiet room and do this and come back home so that you feel rested and can take up the next job (domestic) with lot of alpha waves in you .

When you have very serious learning/administrative/management schedules (in case of scholars/leaders etc) take power naps to cope with long days of work demands .Mothers do this when the young newborn one is sleeping so that she gets energy to look after it when awakened. The afternoon dips are taken usually by leaders . That is a 5 minutes time after lunch .

Select a quiet comfortable place where you are not interrupted. Turn off phones, computers or any other disturbances for 5 minutes. Lie down or sit relaxed and keep an alarm for waking you up exactly after 5 or 10 minutes whichever you have at hand . Close eyes, breathe evenly slowly and have a melodious positively visualizing music of your choice .

While I was a child I found out the technique of having a 5 minutes relaxation music and 15 minutes study . That was quite accidental. I was a music lover right from age 3 or 4 as shown in the ladder of my life above. And when I got a Philips transistor in 1961 (at age 15 ) I started to hear it regularly . In fact it became a part of my body and mind . I will study for 15 minutes or so and then turn on the radio and hear at least one song before I resume my study . My mother at first used to ask me what are you doing ? Are you studying your lessons or just killing time by listening to music ? Do you want to be a doctor or a singer ? .And I used to tell her I would love to become both . This habit of interspersing music with my study pattern stuck to me as a habit and in my study/learning ladder . It has helped me to improve my brain status , concentration, memory and study of numerous branches of knowledge (both sciences and arts ) in record time .

Only later on , when I learned neurophysiology , did I understand that the music was doing this great help to me . After the brain was working for 15 minutes and was in beta waves , the music for 5 minutes was bringing it back to alpha waves and relaxed rested state so that it could concentrate more and learn more . That was my power naps for learning . My husband used to call it my battery charging technique.

Establishing a bedtime routine will be of help for insomnia patients. You can take a lukewarm shower just before bedtime. Drink a glass of milk . Milk has tryptophan which encourage relaxation. If you are allergic to milk take a herbal tea with some drops of pure honey .Put music that brings back best beautiful memories and visions to you and you can actually select a wide variety from your loved and cherished musical repertoire and have variety . Personalised music is best for falling asleep .

Those who love literature can take a favourite book and read it till you feel sleepy .

Rearranging bedroom with a few flowers or a nice nature photo with pleasant colours and having good ventilation and temperature control and a noise-free atmosphere also can help .

What habits are to be curtailed ?

Do not eat heavily at dinnertime.

Do not watch a terrific and noisy television programme , at least just before bedtime

Do not eat too much of cakes and sweets . Have fruits and vegetables more in diet .Eat an apple/banana at night and a glass of milk .

Make the bed /cot comfortable to sleep .

Thus maintaining a sensible diet , a good breathing and relaxation pattern and good smoothening personalized music for positive visions , one can parent oneself and heal oneself of insomnia .

## Case history 2.

Sridhar , a general practitioner had high levels of anxiety. He was an intellectual, a perfectionist and was popular among his clients and had a devoted wife and a normal child . His financial condition was not bad and there was no need for any anxiety from professional or domestic side .Yet he had frequent anxiety and panick attacks .

He was very much afraid that all these good things he is enjoying might end suddenly and he will loose everything . He told me that as a child he had lost his mother and as an adult when he married according to his preference (his was a love marriage) his father abandoned him .And now he is clinging on to his wife and child and he is afraid that they too will leave him by some mishap .



Either by disease/death or they might even abandon him and this fear was worst when he thought of his wife whom he thought exceptionally beautiful and intelligent and vulnerable to be abducted by some one else..A sort of misplaced anxiety and obsession was gnawing him day and night though it was not needed .This anxiety lead to sleeplessness and indigestion and later on to Irritable bowel syndrome (IBS) .

Here we are dealing with an anxiety and panicky attack which is slowly turning to an obsessive compulsive fear and to a physical problem called irritable bowel syndrome. Thus this is a typical example of a stress response.

What is stress ? Anything that makes an individual feeling anxious is stress . It might be a real stress in life or an imagined or feared stress too. In both cases the symptom manifestation is same but the causes are so different .

Symptoms of anxiety : Breathlessness, dizzy feel, palpitations, and a feeling that one has to run away from the dangerous situation but is helpless to do so , as we sometimes experience in a dream with an elephant running after us.

Anxiety has common causes like exam overload, missing a job, or failing an exam, etc and a prolonged anxiety can lead to depression which then becomes a serious problem . Anxiety or flight response is actually a phenomenon showing that your system is trying to cope with dangerous situation. The dream of a elephant is significant. Because in early human history when dinosaurs and mammoths roamed the earth, it was the first response humans had to escape from danger . Anxiety shows your system is alerted to some sort of danger from which one wants to escape and at this stage if one deals with it effectively one can prevent depression and also psychosomatic diseases and all stress-related disorders .

When brain alerts danger, though you are not running you sweat as if you are running so that body is cooled to make you run fast. To run fast , an empty stomach is best and the feeling of nausea is to alert you that you need less or no food. The lack of attention/concentration is not real but because you are focusing on a danger to be dealt with , you are not concentrating on any other thing at all. Thus attention deficit shows a concentration of attention only on one thing (though it may be imaginary) . When it is a real danger , a man's precautions to avoid it and to reduce its risks come under management and administration and in problem-solving skills and decision-making . But when it is imaginary it takes a different turn and becomes an obsessive compulsive fear which is impossible to be coped with by the individual .Thus the same mechanism makes you a great leader with visionary skills of problem solving, systematic planning and administrative skills as well as a depressed psychosomatic individual . What makes these two spectrum is within us and we can control if given some self-healing practices in daily life which is taught right from childhood. A stitch in time saves nine. A proper way of world outlook and lifestyle makes children deal with life positively when time comes and lead a healthy life. The survival instinct of living organism is manifested either as flight and freight or as proper problem solving behaviour and leadership. Therefore do not wait till the danger comes . But give all individuals of society a proper method of

self-healing even while they are kids . That was the system of education in India which our ancients tried for millennia and music and ayurveda and Yoga are all part of that regime .

The main reason for this illness is considered as poor early care during infancy and childhood . The childhood trauma has a lifelong impact on individuals. In this case the death of mother was a great shock . And when the father also discarded his love for him just because he loved a girl of his own choice made a lasting impression on mind that all his loved ones will leave or discard him . The reason of death by some disease and then deserting etc became a perpetual haunting problem which the system could not cope with . The neurochemical development of our brain is such that some people have a very high stress thermostat . The brain is set at a permanently high level consequent to a extremely inconsistent and negligent , frequently distressing responses to the need for love, care, nurturing etc which a child needs at its infancy . When such poor care happen the brain is set to overreact when a stressful condition happen .

How best we can reset the thermostat ? If the person understands his own vulnerability of situation, and allow a selfhealing technique to work , it is possible to help. Priorities of relaxation, regularly and identification of stressors of life are important .What was the early trauma ? How the child responded to it at early years ? Or if it a trauma occurred in later life what was it and how best we can deal with it ? These are important in dealing with any PTSD.

To keep an anxiety diary is to keep a life diary itself . Either the client or the relative can keep one in case the need arises . Dealing with a fear situation is not necessarily running away from it. We can fight with it and control it . That is to be done in such cases to overcome anxiety . The strength for it has to come from relaxation, yoga, music and other hobbies which brings positive visions of life .

Graded relaxation was devised by Edmund Jacobson in 1920 for progressive relaxation. You have to get a minimum of 20 to 30 minutes for doing this . And make this time without any interruptions . (like phones, or any other disturbing calls) .

The body is first allowed to tighten and then slowly relaxed in 9 parts . The soft melodious music can accompany the process .

In Indian system this is called the *Aavarana* or *kavacha* as *dhyana* . You are thinking of each of the nine regions of body as the nine *avarana* of the *Srichakra* and the nine planetary fields (*Navagraha*) . For this special music is there . If you have not heard the specific *navagraha* and *navavarana krithi* there is no harm. You can still have a *good raaga* for each of these regions in the *Melakarta* raaga scheme which is for both biological and cosmic field and includes all the cosmic/planetary areas in question.

The nine areas : 1. From the tip of your toes upto the root of the legs and perineum which is the *Mooladhara chakra* . *Bhoopura Thrailokyamohanachakra* in *Srichakra* .

2.From root of legs to pelvic muscles and lower abdomen and lower back . This is the *swadhishtaanachakra*. This is a practice akin to what one does when one is unconsciously doing in the process of a union with one's lover . This gives relaxation to all pelvic muscles,including smooth muscles around the generative organs ..*Sarvaasaapariapurakachakra* in *srichakra*.

3.The stomach and upper abdominal muscles and the corresponding back muscles .This represents the *Manipura chakra* . if you are defending yourself some one who is about to hit your stomach and then release as if you are lowering into a warm scented lake (swimming pool) and allow the warmth of the lake to melt away all your tension and heat . *Sarvasamkshobhana* in *Srichakra*

4.The chest with lung and heart and the corresponding back muscles. Fill your lungs with air as if it is a full balloon slowly and steadily and this is part of *Praanaayaama* . Release slowly . The hand, shoulders and upto the fingertips also are included in this area . This is for *Anahathachakra* . *Sarvasoubhagyadaayaka chakra* in *Srichakra*..

5. Neck, mouth, jaw, palate and cheek . Concentrate on the movements and vibrations of this area with mental repetition of the music you hear and feel the strong vibrant energy yourself within you . This is your *Visudhichakra* . And *sarvarthasadhakachakra* in cosmic *srichakra*.

6 .The eye, forehead and the space between your eyebrows . This is *Ajnachakra* . This is the *sarvarakshakarachakra* of *Srividya upasaka*

7.The head and the brain which is *sahasrarachakra*. This 7<sup>th</sup> *ckakra* is the *Sarvarogaharachakra* of *Srividya Upasana* and contains all the other 6 *chakra* within it .

8. The field of energy which is continuous with your bioenergy so far described . This field of energy around you is also in continuity with cosmic energy and links with a greater source of energy from nature which if you want can be called God or if you are nonbeliever just as a natural force . Whatever name you give it is not important as long as it gives you strength to cope with all difficulties and stresses and tensions .Imagine yourself as a speck of that greater force or energy field pulsating and vibrating with it and continuous with it . This is the *Sarvasidhipradha chakra* of the *Sidha* and *yogins* .All *animaadi sidhi* reside here .

9.Finally from the macrofield of cosmic energy around and in all organs of your body and mind , concentrate deep into a single point within you , through a ray of light entering you through the *ajnachakra* in between the eyebrows and spreading down straight as a lamplight and flooding a point within your heartspace . The *Bindu* which is the center of the entire *Sripura* is here . (*Sripura Bindumadhyastha* position)

If you are using *Navagraha sthothra* instead of *Navavarana* of *Srividya* you are meditating on the solar chakra or solar system and then the order from below is

1.Earth as *Mooladhara*

2.Moon and water as *swadhishtana*

3.*Manipura* as the Venus

4.*Anahatha* as Mars

5.*Visudhi* as Jupiter

6.*Ajna* as Saturn

7.*Sahasrara* as Sun

8.The halo or aura around as *Kethu* which comes from beyond (cosmic energy) and become manifested near earth as a aura of light

9.*Rahu* as the tail end or *mooladhara* of that cosmic energy .

Thus starting from *mooladhara* of the biological being , one reached the *mooladhara* of cosmic energy and its interlinking and continuous flow in cycles .( The various views about this nomenclature of *Chakra* is given in another Book *Bhavana Upanishad* and its *Bhashya* by *Bhaskararaya*).

Edmund Jacobson has not given the *chakra* or *navagraha* or the *kavacha* or *nyasa* of the Indians but just gives the 9 regions of body alone . But for a real understanding of what is happening in this *Nyasa* of body parts one should know the energy flow .

The music for *Navavarana* and *Navagraha* and the *Melakartharaaga* scales are for such meditations and of these the most musically relevant is *Melakartharaaga* scales . When you meditate eyes closed, Jacobson asks us to imagine drops of magic –drops of liquid sunshine is dripping in to each of our organs and sinking into the center of our body and spread in our entire body and enrich us as two warm flowing rivers on either side . This is *Kundalini* energy awakening of our nervous energy and calming our entire system with a rejuvenated new energy and *naadalayayoga* of musical repertoire is doing this as *Saradathilakathanthra* has suggested for meditation of *Vishnu* ..

That is the Graded imagery and visualization and relaxation techniques are only very weak substitutes for what Indian *Ayurveda* and *Yoga* scholars had prescribed several millennia before and it suits our geographic and ethnic conditions and our culture and we need not search for an imported imagery from western psychology/western medical repertoire . With the music we use we can just experiment this and get proof .The relaxation with guided imagery in west ask the patient/client to imagine certain things as suggestions. We don't have to do that . Give a melodious soft music that brings all positive emotions and just ask what she/he felt when hearing the music and we will get all beautiful imageries from them . Thus it is the client who is contributing poetical imageries and not the therapist giving any imagery . This participation of client as equal is very

important for getting a better response of healing . Regular practice of relaxation with music at regular time intervals gives more balance and more of self confidence and protection from anxiety and psychosomatic disturbances . This is a method of meditation . The client chooses the best imagery from what he/she experience and which gives positive response as far as his/her subjective feeling tells and the therapist only assists by listening to the MLP and be of constant support for the process and in case a relapse occurs for further reinforcement of strength . The therapist is a facilitator and a friend in need .Not an intruder . There are many thought blockers which help you tide over anxiety .Any hobby in which you are genuinely interested will help . May be painting, colouring,drawing, sculpture, drama, games and sports and involvement in cooking and like other things which takes the mind away from anxiety . So is music just any other art /hobby to get relaxation ? No . Music is the energy (cosmic) itself in the form of sound vibrations which is same as light rays . It is different from any thought blocker , in that it is the real energy which cures and the other arts are the mere blockers of the anxiety thoughts . Blocking a thought temporarily and healing are different processes though one may strengthen the other . Music can act both as a energy vibration for healing as well as a thought blocker . This is its added advantage .Music is a personalized thought blocker for a musician just as poetry is for a poet .But it is also a healer for all people by the vibrations brought in it which balances all imbalanced vibrations brought in by stress . Reassurance from oneself and social support helps us to cope with our stress . And most of our Indian patients are stressed with poverty , and the problems which come with it and most of them (60 % of the entire population) are living on agroindustry . Therefore the social support is by giving supportive measures which will give food self sufficiency to our nation too . In previous regimes of royalty , the royalty had musicians to give them anxiety healing while people had their own folk traditions. These made us a healthy happy self sufficient economy which attracted foreigners. I think by 2020 India will be again regaining a food self sufficiency and proper water management and health by such measures and music as a link of integration will have a great role in bringing about that transformation .

### Case history .3

This is about a musician . He had a problem of fear when he reached a new place. He was afraid of the strange place because he was from a very remote village in India and reaching great cities especially abroad , he felt a panick and a cultural shock and sometimes an anxiety and tension. But he overcame all these very effectively by self help . How ? He had music as a great thoughtblocker which he carried in his own mind, in his self as an internal power . It is a permanently portable thing within .Whenever he had a tense atmosphere whether by a strange city or a strange person who gives cultural shocks or a very rude event or assault he started not to respond to it with his emotions but with his music . How did he do it ? He thought he will improve his musical skills instead of getting anxious at such things . He had several scales of music which he could mentally permutate and combine to make a new piece and when he started to do this exercise mentally he understood all the secrets of permutations and combinations of the so called *Melakartahraaga* and he became very confident in singing them . This was a natural process for him . By this mental

arithmetic of musical vibrations and its *prasthaara* (as it is called in Sanskrit) he became very cool and composed . He had found the peace and self confidence and in the process he had become a master of Karnatik musical repertoire . The process of cyclical repetitions of the two flows of energy as *Ida* and *Pingala* was understood from the 72 melakarta scale when sung in *raaga prasthaara* . And that naturally awakened all his *chakras* and he became calm person by self-healing .

#### Case history 4

This is a story from another musician . His problem was that he feels a sort of tension state when he hears the *Raaga Mukhari* and *Vasantha* .He is a person who loved *Katahkali* music right from childhood . And when he hear *Mukhari raga* he starts crying , and feels tired and dizzy . He feels a mental tension though it is suppressed and a external peace is shown . He said it is like when a breeze come and the dust spread in air but the red cinders within a fire are making a sort of burning within one's heart. That was a poetic description. I asked whether he feels it whenever the *raga* is heard and whoever sings it . He said yes . In *Bhaavayaami* when the lines *Anaghapampaatheere* reaches the feeling also starts . When some one sings *Sripathe Srinarayana* also he gets this feel.

I asked when did he hear this song first and who was singing then ? He gave a very pertinent answer .He said that was on a *Katahkali .Nalacharitham* 4<sup>th</sup> day was enacted. *Unnikrishankurup* was singing .He didn't know the *Raaga* then.He went inside and asked what the *raga* was because he had a tense feeling . The context was when Damayanthi could not recognize Nala and was in deep sorrow and from that day onwards he has the same tension when the *raaga* is heard.

But he could not remember any such instance for the *raga vasantha* .The first *Vasantha krithi* he could recognize was Swathithirunal's *Vasantha* .He felt that he has chewed a carbon piece . His Blood pressure increased . He says he had even made it measured and proved it .Whoever sings *Vasantha* he has the feeling . I asked him , have you got a predictive behaviour that I will get this when I hear such and such a *raga* . He said it is not so . In *Vasantha* he says it is when the *Dhaivatha* of *Vasantha* comes he gets the feeling of chewing a carbon .

What I understand from his description of *Mukhari* it is an easy diagnosis.It is not because of the *bhava* or the *raaga* but by the *vibhava* the *raaga* evoked when he first he heard the *raaga* that he gets tense with it .

In the case of *Vasantha* such a history is not available .*Vasantah* is a *panchamavarjyaraaga* .*Sagamadhanisa* is ascending and *sanidhamagarisa* is descending . *Ragachayaswara* is *Gamadhani* .It is a *janya* from 17<sup>th</sup> Melakarta *Suryakantham* and is a *Rakthiraga* .*Mukhari* is *Natabhairavijanya* and also can be *Kharaharapriya janya* .

Searching for a cause of this strange phenomenon I came across the phases of mind produced by musical sounds /notes in the psychology of music by H.P KrishnaRao .(page 23).

Sa and pa are shanthaswara

R1 and D1 =disturbances

R2 and D2 = perceptions

G1 and Ni = disagreeableness

G2 and N2 =enquiry

M1 =optimism/egoism

M2=Degradation

The lower tetrachord =sensual plane of consciousness

Higher tetrachord =Intellectual plane

The higher and lower octaves are reflections of this principal octave . If we take this description , then the problem of this musician in Vasantha is at the intellectual perceptual planes of *Chathusruthi Dhaivata*.The problem is that he first came across *kathakali* music and then with classical music and is comparatively analyzing the two at an intellectual plane .Thus even this is a *vibhava* for him which he does not understand for himself. But his conversations lead us to that . Because when he speaks of *Paadi raaga* of *Kathakali* where it is used only by *Kathi* (cruel) actors for creating *sringara*, *bhayanaka* as well as *bheebatsa* he becomes very communicative. One must understand that *Vasantha raaga* is not there in *Katahkali* . That is why he cannot locate the *vibhava* experience . He said an opinion about *Gopriya raga* .He said that a German scholar/composer called Cloud Ashley De Bussy made a new *raga* in TBS scale with 1 ½ gaps . This made him popular in Germany like the *Lajjavathy* music here in Kerala . But ,the fans were very violent and were even chewing ears of the neighbour . The karnatic music in this scale is the *rishabhapriya janya*, *panchamavarjya Gopriya* .When he asked Balamuralikrishna about *Gopriya* ,the musician gave him an advice that it should not be sung on *satges* and if sung both the singer and listener will become mad .This dialogue (His MLP) made me understand what he had in mind about his experience of *Vasantha* .

1.There is a problem of intellectual perception which is related to the *kathakali* music and to western music that is associated with the cruel or mad responses .

2.For *panchamavarjya* and *Chathusruthidhaivatha* he attributes a feeling of eating a piece of charcoal . *Kari* or carbon was the dress of *Nala* in *Nalacharitha* in which *Damayanthi* could not

recognize *Nala* and was full of sorrow and suppressed emotional tension. Thus the GIM of a *Kari* is the reason for his negative emotion here and thus it is a *vibhava* only

3..He thinks the *panchamavarjya* *Gopriya* should give the same experience of madness since its scale in western had given it and Balamuralikrishna has said so. The *Gopriya* is *panchamavarjya* like *Vasantha* but it is D1 with a disturbance

4.In *Mukhari* it is not *panchamavarjya*. But D1 D2 are used . The disturbance in *Chathusruthidaivata* . He can explain this with his childhood experience of the *Nalacharitham kathakali* by his intellectual differentiation of *raaga* .

This is what he wanted to communicate to me intellectually .

The facts as I see are :

1.Karnataka music has no *bhava* of *bheebatsa* , *bhayanaka* or cruelty .They are generally *shantha*, *karuna*, *muditha* ,(as described in *Yogasasthra*) with *sringara* and *hasya* and *veera* to some extent .

2.Only when the *vibhava* of *roudra*, *bheebatsa*, *bhayanaka* etc are brought out people become unbalanced and cruel and mad . And that too when the noise pollution level exceeds as in *kathakali Kathi vesha* and in modern western music .

3.Individual variations produce *vibhava* and childhood experiences have a major role for *vibhava*. He is able to identify that his friends who are not interested in *Kathakali* or *kathakali* music are not affected negatively by these *ragas*. So that he connects it with his *kathakali* music . (The musical atmosphere, background and MLP of this particular individual makes him react in this way and it is not the fault of the *raaga* ).

4.The *sahitya* and different singers and their effects : He says any singer singing that raga gives him tension .

Now I will come to the *sahitya* of the said *Raaga* in the *krithis* which he mentioned .

*Bhujagaadhipasayapuradamayavimala*

*Bhooshanabhooshitha dehaa*

*Bhujayugalodhritha samkharathacharana-*

*Bodhaakaradrithamohaa (Vasantha)*

*Kanakamrigaroopadhara kharamaareechakaramiha*



*Sujanavimathadasaanana srithajanakaanweshana*

*Anaghapampaatheera santhathanjaneya nabhomani*

*Dhanujasakhyakaara baalithanudalanavesha(Mukhari).*

In both these *sahitya* the *Subhakavyalakshana* which *Bharathamuni* speaks about is not seen. The *swara Bhu* is repeated in *Vasantha* , and the word *Bhujayugalodhritha* in which *udhritha* and in *Baalithanudalana* of *Mukhari* as *Rama* killing *Bali* have a bearing in his mind of the *Kathakali bhaava* which he is used to . The *sahitya* has a element of cruelty of killing which is usual with *kathi vasha* of *Kathakali* .Thus the *vibhava* is related to *iyal, isai, nataka (sangheetha, sahitya and abhinaya)* of an intellectual nature . It is an intellectual perceptual disturbance for him and can be removed by himself if he is able to understand that problem .

5.The *janyaraganighantu* of *Ragasudharnava* (page 125) says something which this musician has read and told me as if it is his experience . But he had gone wrong in his spelling as well as the name of the composer and his nationality . It is Claude Achille De Bussey (not Cloud Ashley) . De Bussey's scale is spelt as TBC by this person. He is a French composer , not German. And his scale is just an arithmetic progression 1-3-5-7-9-11

That is

*shadja, Chathusruthirishabah, antharagandhara, prathimadhyama, sudhadhaivatha, kaisikinishada.*

The *swara* of *Gopriya* are *Sari gamadhanisa* and *Sanidhamagarisa* .

De Bussey's scale is *Sarigamadhanisa* .There is only one *krithi* in this *raga* sung by Dr S.Ramanathan in *Roopakathaala (Namora vinaraadhaa)* . We don't know whether he and his audience became mad and cruel . Ramanathan is not alive and it is doubtful whether we can ascertain any one who heard him sung that *raga* is alive too for getting evidence.

But according to R.A.S Iyer's *Karnataka Apoorvaraaga* compositions 2 more compositions in *Gopriya* is listed .

1.Gopinatha . Composer BSM (Bangalore S.Mukund) khandathripita .

2.Gopriyam Gopalam .P.P.R (P.P.Ramakrishna with Mudra Krishandasa) Thalam not mentioned .

If someone is interested they can do a study with their audience . Only then we can say what Dr Balamuralikrishna told is true or not . Even if it is Balamuralikrishna's opinion , in science of music therapy , it has to be tested to be accepted . That is the way of science .

But if we look at the diagram given in H.P.KrishnaRao's psychology of music the balancing happen at 45 degree where intellectual and musical faculties are mutually balanced . And the problem of my client is that he is not balanced and goes more to the intellectual nonmusical side of it . The

problem of an intellectual ego or superiority complex is in him which makes him blind to what is happening to him and thus preventing him to selfheal himself even with his knowledge of music. This happens with musicians and it is such people who are difficult to be taught the secrets of selfhealing . The ordinary man is more humble and does what we ask them to do and are able to self heal at a quicker pace than an egocentric intellectual musical person of scholarship in classical *ragas* .

From these two case histories of musicians who approached me and shared their MLP with me I gathered some very good lessons. The first one is a wellknown and famous person but he came to me not as a musician but as a healer to whom he can share his problems as if to an equal and get a supportive word for ensuring his ease of tension . And he got it . The second one is a lesser known artist but with a very huge intellectual ego and was not prepared to listen to selfhealing or what music therapy is about, but was very particular that I should know how much he is aware of musical nuances and that I accept that his scholarship was almost akin to Balamurakikrishna . He didn't actually want a help but a showing off of his scholarship about music and its effects to me of which he was very sure that I know nothing of, being not a trained musician . The training in therapy /healing/medicine /psychology and a little bit of knowledge and involvement in Indian classical musical repertoire is enough for treating a person –even if he is a greatest stalwart in music . But , the other way round is not true . Whatever is the knowledge of music , unless you know the psychology of the person who comes to you and the nature of the various physical, psychosocial diseases we may not be able to heal a person . Thus egos of self has no place in self healing . To get over the problem of tension with *Vasantha* and *Mukhari* he has to do away with his intellectual baggage of ego and start to view the *raaga* in a new perspective , as a beautiful experience as you and I do with no preformed bias . But if he is not prepared for that he will go to his grave with the same tension when he hear those raga and wondering what is the reason for it , and never solving the problem . A music therapist will never ask about the difficult times of past , unless the client him/herself comes with it . In this respect it is very different from Psychology where a psychologist will never allow you to forget a painful past by his probing questions on it .

From case number 2 and case number 4 (a scholarly Doctor and a scholarly Musician –both intellectuals –yet fails to see reason ) because of too much of ego and pride in one's discipline and its knowledge , one finds it difficult to treat . If ego is not there and if one genuinely wants to overcome a difficulty/problem selfhelp and selfhealing happen with aid of another person/therapist . Ayurveda texts has said that it is difficult of treat a scholar and a Vaidya . And I saw it in my personal professional career .Try to deal with a painful past and get over it . Trying to find out the beauty of all *Raaga* , and enjoying them will be a good lesson for the *Mukhari/Vasantha* problem Musician.

How to deal with a painful past :

1. People confide in a close friend all their woes of past .

2. A better method is to write down everything as a diary /narrative and share with therapist who is the best friend .

3. Understand that the misfortunes are for us to learn from life and be humble and get strength from such experiences

4. If the grievance is by an individual say to yourself that so and so has been rude to me but I do forgive him because he has done it due to his ignorance

5 You need not forget the event but can forgive the doer who inflicted that wound. By this you have learned a lesson to avoid such hurts and at the same time kept your heart and thoughts clean of any illwill to any creature, even to the person who inflicted the greatest wound . Thus you remain happy and innocent and compassionate which will help you to heal all the past hurts/wounds .

Music is a help for that . Psychology is trying to find out what was the reason for your behaviour and for this probing they make you wince at all the pains you had undergone come alive again . But music therapy just take it that all mishaps are *apasruthi* in one's life and with divine music one can bring back *sruthi* and then *apasruthi* is naturally erased . The sins are not sins but ignorance only which can be forgotten or at least forgiven though not forgotten . Thus healing is a compassionate exercise in music therapy . The purpose is ofcourse , selfish (for self healing) but it also heals the others in society and even the inflicter of the wound . There is no enemy in music . Only friends . Those who commit mistakes also needs compassion .

6. How we react to the world shows how we are made of . We may not be able to change the world . But we can change ourselves and live harmoniously with it and be healthy in all respects .

7.. The negative thoughts and beliefs in each and every one of us is transformed to positive .

The following are the common negative thoughts/beliefs in human beings. See and identify which of you have, to be changed . Only by identifying a negative thought we can change it .

- I am perfect . All my problems are due to the world/society/other persons.
- I am threatened by others /world
- I am bitten once . I don't want to try a second time
- I should do it , but cant . Then you have a duty , reaction, or a desire . Find out which of these are in that should first . If it is a duty do it . If it is a desire you can conquer it and if it is a reaction –if positive try to do it and if negative avoid it
- Helplessness . A learned helplessness is what we see around us in society . We find everyone saying I want this and that to happen in society but I am totally helpless. If we want to do a help , we can do it to at least one person or for one cause and that takes away this negative thought . If each one do at least a good act a day , this world can be actually changed to a heaven .

- Fear of failure and ridicule from society . Sometimes even a fear of rejection.
- Failure is a best teacher . It makes you desirous of learning more and achieving a success. And people praise you when you achieve and ridicule you when you fail and that is only a passing event . We can change the ridicule to praise by our own will to learn and act .
- Finding fault with some one and making that person a scapegoat is a common practice seen in homes (with first born children especially) and in professional life . This habit makes the concerned individuals exhausted mentally and they have a sense of duty but always feel that by some fault of theirs they haven't achieved it and feel guilty ..The victim mentality can lead to a isolation socially .
- Not deserving attitude also is a negative emotion to conquer . This is inferiority complex
- The opposite is I am me and I do deserve everything which is superiority complex and it is another rnegative emotion to be conquered .
- Catastrophying is jumping to the worst possible consequences even from a very trivial event and is common with pessimistic people.
- Doubting jack and one who miss all good moments in life

To have a positive mindset and remove all negative mindsets , first identify which of the negative mindset you have . Then with positive imagery try to build a confidence and remember all the good things that have happened to you in life . For this we have to choose the best music emotionally giving good imagery and this can be personalized music of choice or devotional melodies and beautiful lyrical pieces bringing natural panorama to our mind . Never use sad and cruel noisy and hard music for health and healing .

A few suggestions:

- Focus on small pleasant things in life and enjoy them
- Rediscover the early childhood interests and restart them
- Keep a diary in which you write all the brightest moments of your life so that you feel refreshed with everything positive . The nature, the poetry, the childhood friends , the music you enjoyed with your parents and friends and sisters , and the best things you admired at that time . Even a first love which is still alive in your mind , but unspoken . All these narratives will give you how beautiful the world had been to you and how insignificant are your negative feelings and worries .
- Depend upon the best music and best books you love as lifelong companions .
- Use meditation, prayers and other mind-body (psychosomatic) techniques of healing along with music . That will speed up your self healing
- Focus on your strengths and not on your weaknesses
- Take care of you as a whole person and not as a separate organ which is diseased and needs attention
- Distinguish between your needs and wants and desires
- Understand money as it is and learn that money and luxuries alone is not enough for health and happiness . Fame also does not bring happiness or health .
- Love is needed for happiness and love within your heart for all creation is the best love that heals all wounds . Do not search for love from another person. Have love within to all humanity and for all living things. You are then the richest person in the world and the healthiest and the happiest .

- The soul walks not upon a line, neither does it grow like a reed. The soul unfolds itself , like a lotus of countless petals .(The Prophet . Kahlil Gibran )

That is the *sahasrapadma* of your mind, thoughts and divine energy . Understand and acknowledge its beauty and potentials to heal wholistically and use it . Music will help you to unfold it and enjoy its beauty and power .

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2. Bhavana Upanishad Commentary of Bhaskara Raya .Dr Suvarna Nalapat .Unpublished
3. H.P.KrishnaRao .Psychology of Music pp 23.
4. Janyaraaganighandu of Ragasudharna pp 125

#### Chapter 19 .Two vital questions

1. Do all professionals/doctors /teachers feel as I do feel about the nobility of profession ? If not what are their reasons ?

2. How a professional should develop more confidence in profession ?

The answer to the second question I would give as : There are two routes to confidence. One to invest time in learning more and more about your profession and never get tired of acquiring knowledge , and enjoy in the process of self-educating yourself. That is self-help and self-healing . The second is to practice whatever you have learned in your own life first and then only start teaching/preaching it to others.

The first question is not that easy to answer . Because there are more people who have different opinions and their reasons too are different. Some one asked me (from my own profession) is it not foolish to resign from a profession you already have, with job security, position and lots of money to support you, for advocating and learning something which you cannot be secure with and which probably may not happen in your lifetime ? Is not that a wildgoose chase ? This he said because I was resigning my job as a Pathologist to pursue a new career in advocating music therapy as a panacea for selfhealing and all the illnesses of individuals and society .

From the point of his argument it appears true . But , from my point of view , it is not. That probably gives you the answer to the first question partially. By resigning a job I am not resigning from my knowledge of Pathology which is already in my neuronal networks stored as memory and what I do with music therapy is only an extension of that professional experience and expertise and that is an inner urge that had been there in me from day one of my career which I had to prolong due to the financial restraints and responsibilities of my family . Now , at the fag end of my life, if I do not give what knowledge I had aquired by the intellectual pursuits of my life , practiced throughout life , it would be a suppression of my own *Athman* and a loss to posterity , because by this the entire system of medicine and society should heal itself of its illnesses . This is not for a single client/single individual and his/her family but for entire humanity and hence the sacrifice of job is for a better cause and is worth taking a risk . But may be every one does not feel that way and wants to cling on to money, position, comforts that a career brings along with its security of different sorts to one's family life.

#### The context of client relationship management (CRM):

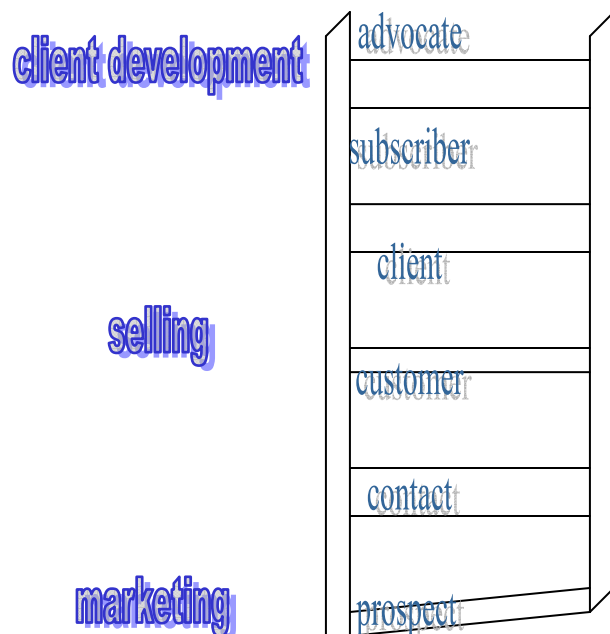
Professional skill is always related to client management . It depends upon :

1.The general needs of the society . What research one has done to find out such needs ? And how the particular skill helps to fulfill the needs perceived? As a professional doctor , if one is blind to the needs of the society, and concentrate only on one's bank balance and comforts one can never do such research and act accordingly .

2.The specific needs of each individual . How one responds to such needs ? And how one listens to the needs and solves them. It is a one to one relation between the therapist and the client

2.Client development . The retaining of existing clients by doctors is at present a goose chase, according to me. .They just retain a hospital job, and it is a floating population of clients they get. The same client returning to the same doctor is either a rarity , or if it does occur it is with a complication/side effect and not due to any personal love and belief as in the case of family doctors . Hospital medicine is too impersonal for that to happen. Ofcourse, there are several exceptions to this rule.

The client management by relationship is thus by Finding, Minding and then by blending these in actual practice. The difference between an advocate of Music therapy and a marketing/selling music therapist one can draw as a ladder.



The advocate is a client developer and does not have the selling or marketing jobs and he/she is a thoroughly professional person with profound knowledge and a expert in what she/he advocates for the general benefit and welfare of society as a whole and her clients are the hospitals, the universities, the faculty members etc and through them (through such clients as doctors/therapists/teachers) the knowledge of expert seeps into entire society . Money making is by the hospitals and the clinics which use the technique or by the colleges and universities who offer a course in music therapy . All of them use the expertise given by the advocate of the therapy , but she/he is not a seller not a marketer but a thorough professional and expert . So the value of the art and science of music for general welfare is preserved by such a Guru /teacher for all generation of students to come . This is what I am doing with my Music therapy protocols and integration of all branches of medicine and arts through it .

What is the need for such an integration ? This is absolutely essential for all the problems and splits and quarrels we face in current society due to diverse separatist tendencies. The beginning has to be from a peaceful and integrative art and science that is universal and loved by all and music is that first step for a final goal of emanicipation from all dualities .The needs of a ailing patient, and of an ailing society are both taken into consideration in this management programme of healthcare .But to get across our new ideas to a wider section of society we have to adopt some methods .

Indirect methods are : Advertising , signs and posters, media relations, sponsorships, and websites etc and also from word of mouth .

Direct methods are networking, presentations, visits, mails, seminars, briefings, hospitality, telemarketing , e-marketing etc.

I didn't have such advertising or marketing skills . But , by nature my writing skills and teaching skills and my opportunities to address public forums and meetings as an orator and teacher helped me to have a wide network of people who appreciated what I was doing and by their words of mouth the ideas spread . And now there are several hospitals and institutions taking up the music therapy protocols, some with genuine interest and others with an aim of making money only. But the idea have taken deep roots , both in Kerala and Chennai and other places in India and abroad . I can assess that from the people who approach me for more details on the subject from various parts of the country and abroad. That is what a Professional is happy about . Analyzing my current status of research and the present situation of music therapy as a discipline , and reviewing what skills I have developed and what services I have done to the discipline , and looking at the market where Hospitals, universities and media are catching up with the programme I am satisfied as a professional but also dissatisfied seeing the way it is going forward as a mass marketing campaign and not an educational and service tool for humanity .

What was my objective ? Was it a financial target of income , profit , reputation and commercialism ?

Was it just a short-term objective for a individual patient and family ? Or was it a long-term plan for healthcare of entire nation and world ?

Didn't I envisage a programme in which health is not merely absence of disease but is a perfect calm of mind and soul and body which in turn brings about global peace ? Are my clients-the institutions and hospitals-which take up music therapy having the same aim ? Or do they have another aim /making money ? That has to be dealt with now and I find at this juncture the global awareness of my message has to be made very clear for the sake of peace of entire world . It is for this now I need the help of all like-minded individuals for a right cause .

The likeminded people means they have to understand that my programme has the potential advantages of :

- 1 A superior service combining art and science-Humanitarian values and scientific research
- 2.A superior knowledge of integration of all medical systems –both indigenous and western –not just one branch of medicine .And to this better research and information systems of modern era being added
- 3.They have to perceive the advantages of such a system



4.They must be able to cognize the low cost operations possible in healthcare reducing the high costs involved in current medical practice

5.The advantages to individual as well as to society and the self healing of humanity for world peace

.Mayson's sources of Value for a client-therapist relationship are a personal relationship, a high level of technical expertise and processing (the volume matters), ability to co-ordinate services and information engineering (publishing one's knowledge).The value of such expertise is that it will be sustained long-term . It is not a short-term plan of minting money but a long term plan of building peace and harmony in entire world . Hospital protocols at individual level is only a beginning of a long journey .

My publications aim at

- Alerting the readers to know about the advantages, disadvantages and the regulations in healthcare
- Educating them on possible needs they might have in future
- Provide simple advice so that they can use the information in the books for self-healing with music
- Explain the complex and difficult issues and basis on which the discipline is based
- Provide a mechanism by which clients can do self-help and in case need arises approach a therapist
- Remind each individual that one can heal oneself and thereby heal the society
- Making a university/hospital based protocol along with a narrative/family medicine approach and combine art and science in an equal proportion to achieve homeostasis in society and its attitudes to arts and science

When people call or invite me for seminars, workshops or speeches I readily go because they are giving me an opportunity to spread my ideas of universal love and compassion . But when people invite me for other functions-like a party, a marriage and social functions –I do not accept that readily .,because it does not serve a purpose and it actually is an antithesis of what I advocate . Networking through Gossip friendships have never been in my agenda so that my friendships with women and men of that sort is almost nil. When such people come around I run away from them remembering Charaka's famous words that one should avoid such people for one's mental and intellectual health .

Action plan:

Thus I select activities which help me achieve my objectives. And I assign priorities to those actions. I am an artist and hence a dreamer but I am a Doctor/a scientist and a realist too. Thus I combine both in the correct proportions to give shape to a goal that is achievable by any one who cares to do so. I do communicate my ideas, my research and its values to all those who come to me for

guidance and knowledge and do not keep it back as secret , since what I have in mind is more than my intellectual property right .I have a broader aim of giving *Vidya* to all who seeks for it . But I give what is needed for each person , according to the professional and individual background they come from. Suppose it is a musician, I give them a plan which will be of use to them to improve and heal themselves. It will be a music composition –or a plan to develop a music education and research protocol or some thing like that and they benefit from that in several ways. In case a musician does not need such development but needs a change in life pattern depending upon the aging or other factors I ask them to change lifestyle and channelise to serving society by the music which was given as a gift from God and that makes them peaceful . If it is a doctor (from Ayurveda/or any other branch) I ask them to do small research projects and make them useful to themselves as well as to society in a different way that they were used to do before. From commercialism I change their views to something of higher value. If a student comes I make them aware of the potential of music as a strong tool of memory, concentration and learning. Thus the advice vary with the person who come and the need they face. From lullaby (womb) to deathbed (Tomb) one can use music for day to day self-healing and development is what I advocate .Each and every one is given a happiness from that self-healing and they are made to see the importance of giving that peace of healing to society –if not to many , at least to a few around them .Thus home and family life also improves .Monitoring what is happening around and getting feedbacks from the people with whom we connect in this way had been of immense use for such actions at various stages of the programme.From this experience I would advice the music therapists as well as other professionals to have a planning process as follows:

- Analyze your current status /work /skills/services and staff available/the problems in the field of your profession and what you as a professional can do about it .
- Decide what you want to achieve. Setting objectives and selecting targets
- Agreeing a strategy and carrying it out or implementation of the action plan .For this you have to look at the budget you have and the resources too at hand and make a realistic action plan
- Get feedback and monitor and if needed make amendments in action plan accordingly

Skills a professional person should develop:

- 1.Listening skills
- 2.Research skills
- 3.Confidence
- 4.Planning
- 5.Presenting /communication skills
- 6.Integrity of personality
- 7.Empathy

8.Likes/loves humanity and living things

9.Resilience

10.Good speaking/talking skills

11.Creativity

12.Determination to continue the work for the sake of a higher goal

13.Negotiations

14.Consistency

15.Social skills which include :- Personal appearance, interests, knowledge in subject, good manners, and a good acumen for changes happening around, patience, understanding and sincerity of purpose and involvement and above all compassion to all alike without any separatisms.

Who is a professional ?

- One who has learned a body of knowledge
- Bound by professional ethics /laws of that knowledge system
- Take pride in that profession /work and has a commitment to quality due to that pride
- Responsible person
- Anticipates and takes initiative to solve problems
- Gets the job done/reach the goal what profession requires even if it means lot of sacrifice
- Involvement to the assigned role and goal
- Looks for ways to make it easier for others to cope with problems and gives awareness of it to all in the interest of the society
- Eager to know /learn as much as they can about the client /circumstances from which they come and their personal needs /life panorama so that more help can be given holistically to the person
- Listens to the needs of the clients and finds time for that .
- A member of a co-operative team in healing
- Can be trusted with confidence
- Honest,trustworthy,loyal,ethical and calm .Has physical ,mental, intellectual and spiritual health himself/herself so that he/she can give it to others
- Open to constructive criticism and takes it as a means to how to improve the profession
- Acts only in the best interest of client and society and world at large
- Looks into the following with insight and decides which is best for each individual and for the society



Based upon this personality types have to be understood .

There are 4 types of managers depending upon analytical, commanding, amiable and expressive types according to David Merrill.

The analytical is a thinking personality . They prepare well in advance in a systematic way and are very clear and rational, and avoid emotions when they carry out the plans and create action plans. (The *Budhiyoga of Gita*)

The commander type is action-oriented ..They will be brief to the point and avoid chats and social pleasantries and stick to action and mention objectives and achieve results in minimum time span (*Karmayogins of the Gita*). The amiable type ( the relationship builder ) takes time and learn background and ask for opinions of all concerned and reassure all about others and pacify and they are the long time achievers unlike the short time achiever mentioned above as *karmayogins*. Infact Arjuna had done this type of long term planning and his brother Yudhishtira had taken care to take opinions from all learned people of the period as well as of the citizens to achieve what they wanted –a unified empire of *dharma*

and Arjuna running away from that long planned strategy of achievement was the problem and Krishna advised the Gita to make him see the point .The analytical approach of Krishna to avoid emotions at this crucial juncture was the advice for a *karmayogin* as well as an amiable manager of the team .

The 4<sup>th</sup> is the Expressive who are intuitionists. They entertain and stimulate others to do action and are lively, enthusiastic, and ask opinions of all, and remember a big picture (whole /not parts ) and do not get lost in the details to forget the ultimate. The proper proportion of all this has to be in a good leader and that was what Krishna had during the *Mahabharata* period .

I am trying to understand and follow that footsteps of Krishna , the greatest *Naadayogin* and management expert of the Gita .

Empathy and personality types:

Stereotype	Dominant desire
1 Normal ordinary person	Social approval
2.The mover of crowds	Communication
3.Ditherer	Security
4.Artist	Creativity
5.Politician	Win power
6.Engineer	Complete a project successfully
7.Hustler	Material success

Kim Tasso has not included a doctor in this list (pp 58-59) which is surprising since he has included an engineer.

Classification of personality types according to trait and range of types :

Trait	Range of types
Compulsiveness	Compulsive to noncompulsive
Gregariousness	Extrovert to introvert

Autonomy	Dependent to independent
Conservatism	Conservative to radical
Authoritarianism	Authoritarian to democratic
Leadership	Leader to follower
Ambitious	High achiever to low achiever in different fields

Most professionals are classified at present according to ISTJ on 4 bipolar scales where the dominant trait is recognized as descriptors Introvert, sensory , thinking and judging.

This is based on Myers Briggs personality and cognitive traits .

Introvert (I)	Extrovert (E)
Sensory (S)	Intuitive(N)
Thinking(T)	Feeling(F)
Judging(J)	Perceiving(P)

The Enneagram is another personality model which use 9 different personality types.

- 1.Reformer/perfectionist
- 2.Helper/giver
- 3.Motivator/performer
- 4.Individual/tragic romantic
- 5.Investigator/observer
- 6.Loyalist/Devil's advocate

7. Enthusiast / epicure

8. Leader/Boss

9. Peacemaker/Mediator

Peter Honey categorized the preferred methods of learning and learning styles as below:

Experience is preferred method	The learning style of Activists
Reflection as preferred method	A Reflector
Conclusions	Theorist
Plan is preferred method	Pragmatist

This is a very separatist categorization since all human beings learn by experience and reflect on what they experienced and only then they come to any conclusions and then plan a strategy to solve problems of society. These are only stages in one's life .

I do agree with the simple categorization of Kim Tasso (pp 62) :

All dominant personalities need to control, to win, and will make decisions quickly at the spot which is essential for any professional in certain situations in life .And such people ascend to leadership positions ,whether in departments or in politics .That is what I have experienced from my own life. Quick decision making is need of the hour for administrators, for surgeons and for pathologists in several situations. Without that we cant do our professional duties to perfection.

Detached personalities are those who rely on facts and logic and dislike social interaction and he puts most professionals in this category .This is only partially true for me as a doctor and a socially motivated professional .The reliance on fact and logic is my scientific acumen in my profession and I do love social interaction with people who come to me in need .They may be clients, students, colleagues, or paramedical and office staff who needs a advice/help on a particular matter , may be clinical colleagues who needs advice on a final diagnosis of a difficult case or may be even a person who is interested to know about my research and my contributions to society in many other fields other than medical profession. So , dislike in social interaction need not be a character of a professional always .

The third variety is Dependents . They always need social approval, likes to chat, smile, need pleasant interaction/relationship and need guidance /direction and always depend upon others for formulating an opinion . Sometimes just for social approval people go to marriages/parties and the like and make waste of their time also . A professional like me can never waste time on such social gossiping cycles and is totally having an independent opinion unlike the dependent personality and that is what makes a professional different from others in Kim Tasso's classification into Dominant, Detached and Dependent and I would like to modify it in that way .

Integration and understanding of needs and emotions of others is the emotional intelligence which a doctor as professional has to achieve first and the logical and analytical knowledge of the subject or science has to be pursued with tenacity and sincerity of purpose and a combination of these two will make a perfect blend of a professional doctor which is not an impossibility to achieve.



In Maslow's hierarchy of human needs as shown above ,the basic needs alone are not the motivating instincts .For a therapist , understanding the level where the client stands is important. If a person who has achieved all up to the 5<sup>th</sup> level(up to ego needs- self esteem, respect and empowerment passing through the different steps in life at different stages , and yet has a need to self fulfillment of values and meanings in life ) comes to a professional , what one can do is give them a meaning in life by channelising their ego needs from personal achievements to society needs so that they are motivated to serve society in a better way ,by improving the skills which they have already developed (say Music – let



them sing a special protocol of *Melakartha* for benefit of humanity as a music therapy protocol to integrate various medical fields with arts ) and also by motivating them into social help with the social respect and empowerment they have already achieved in society. That will give them a meaning in life and a philosophy fulfilled . But when a person in the first stage comes with an illness stage the strategy is totally different .The 4<sup>th</sup> and 5<sup>th</sup> stage personalities are motivated to give help to the first 3 stages of personalities by their personality and social status and money .This is the motivational aspect of music therapy I have adopted in my programme .

So too the approach varies when the client is in different life cycles. The student life , the newly married couple, the full nest (with young dependent children) and full nest with older dependent children, parents with mentally challenged children, empty nest (when children have left home for jobs/after marriage) and the solitary lonely existence of old age , sometimes with dementia are all different situations and the different diseases and their problems are also there. All these are taken wholistically and in an integrated way and spending time for having proper interaction with the clients and thus helping them to find self-help and quality life and all these require not just one day . The long life lived in pursuit of planning from experience of problems of our society and one's own profession and its shortcomings is the final communication . It has no substitute other than one's life itself .

Context model for organization behavior



Research and prepare	<p>Knowledge about our own department</p> <p>Knowledge of the organization</p> <p>Knowledge of existing problems/practices</p> <p>Knowledge of what makes a client happy and healthy</p> <p>How your profession can meet the needs</p>
Establish contacts and build empathy	<p>Time to meet and talk and listen</p> <p>Provide an agenda that help</p> <p>Decide in advance what one wants to achieve</p> <p>Interest in the person/individual as a whole</p> <p>Develop empathy and rapport</p> <p>Clarify decision-making process at clients level</p>
Explore needs	<p>Ask relevant questions</p> <p>Confirm your understanding of the issue/problem</p> <p>Offer ideas/suggestions to gauge reactions</p> <p>Provide reasons for sustaining information exchange</p> <p>Identify potential issues of restraints</p> <p>Agree with next steps</p> <p>Follow up</p> <p>Keep up the interest</p>

The RADAR process (Reading accounts and deploying appropriate resources ) gives 6 keys for winning an opportunity but what they give is for a sales opportunity and what I give is for a success in getting across and making it possible an idea take shape and implemented.

CHALLENGES	RADAR Process
Value	Link solutions to pain or gain
Resource allocation	Qualify the prospects
Competition	Build competitive preference
Strategy	Determine decision-making process
Politics	Sell to power
Teamwork	Communicate the strategic plan

In my process the competition is a self competition to become perfect in the methods and in the strategies of Music therapy and its management and teaching schedules and hospital research and not competition with other firms. And the selling to political powers does not happen since the therapy is for all human beings and not to any power focus alone and therefore the RADAR process is not for sales but for betterment of profession and discipline and service for humanity .

When one sets an objective one has to be SMART

S for Specific.

M for measurable

A for Achievable

R for Realistic

T for Time-bound

A primary research or field research is done to obtain information and for that one can use a questionnaire with structured questions , or even use informal talks and interviews and also telephone calls in which you collect what information wants about music preferences of an individual .This was done for a very long time and only after that the secondary or desk research was started .The earlier obtained information was used for a purpose . A pilot project was planned on the basis of the primary research .

It is useful to know what is an AIDA (Attention Interest Desire Action ) model to know others and to plan our own strategies especially when the follow-up action is of low commitment priority for you . What you are giving them is for their needs more than yours .Health is not the doctor's concern alone but of each individual's concern and hence it is their priority rather than yours and you are just helping them to keep it up. The long-term and high priority commitments are like a prolonged courtship . A sustained effort to maintain contact happens from both sides .The giver's gain is that he/she is at the higher end and the taker is at the lower end. Receptient is always at lower level than the giver. Whether education, health or comforts of life or material wealth . Therefore be a giver and not a recipient always is my policy in any relationship . I make it a point that the one benefits by a word of advice or a contact with me and not the other way round and never ever accept money for the services I give That keeps me always debt free in relationships .

Focus on what is most positive in any relationship and forget about the negative sides of it is another policy which keeps me always happy . Feeling good about ourselves is also being confident about ourselves . And I keep it a point to be sincere in all my relationships . I do not pretend that I like something which I don't like and people know what I mean and accept me as I am . And I do accept them as they are and do not have false expectations from any relationships. All these will help a person to face life at a peaceful and calm level and reduce one's tensions and stresses .Use positive nonverbal communication (NVC) to demonstrate enthusiasm and express confidence and pleasure in a person's company or singing etc and this will be by a hand gesture or an eye contact and never interrupting the flow of words/music with clappings or other nonrhythmic unmusical sounds . That is also a policy I make when I go for concerts (which I love and attend very often) or speeches etc (which I hardly do )

It is by NVC that a great personality showed me that he has interest to know me and my works and I identified those gestures.

What he did were

- 1.Provided lot of material to start a conversation between us through books and through common topic which I and he loves to talk about Topics of mutual interest were discussed in informal way to start the friendship and I thought he was very considerate in doing so . And also that he wanted to continue the relation since he called on and off to talk about these common topics –Music and Brahman
- 2.Asking my opinion about certain current issues he made it clear that he values those opinions coming from me
- 3.He provided me opportunities to learn from him and about him in many ways
- 4.He made me feel that I am very close to him by starting a conversation which had ended several days or months before , just by picking up the thread as if we had a talk the previous day. It was as if saying that I remember your words

5. Listened carefully to what I said on certain issues and repeated them somewhere else showing me that he has understood my idea and is propagating that in public

He was making me feel that he was interested in me, a noncelebrity rather than being an interesting celebrity to me.

6. A sort of trust was built up between us by his constant calls and informal talks with him and his wife both appeared to be very friendly

7. NVC is dependent on context, culture, gender etc. He was very precise to have a behavior that fits our context, culture and gender and never took liberty to exceed the limit or cross over it

8. When he speaks he alters his pitch and pace of voice and even the accents and a special voice (when he calls me over phone) made it very clear that he is a dependable and respectable at the same time very friendly person

9. Maintaining eye contact was very natural and honest and he introduced all his family members to me showing his nature and honesty

10. There is a personal space around each one of us. That bubble of space is our private space into which no one is given entry. Though very friendly he was careful not to enter or try to enter my private space as an individual and ask about personal life or such other things. Therefore he was a pleasant change from the routine habit of others. He talked about sages, musicians, his own personal experiences and my experiences etc never touching unnecessary topics or gossips.

11. It is said that when a person adopts a tight or closed stance he/she is deterring from interacting with you and indicates a lack of confidence. But this person never showed that closed stance to me and had been always eager to speak and interact with me.

12. Like a desk which is a barrier between two people on either side of it there are some barriers between 2 people. Such barriers were never shown by him in our relationship

13. When we talk he will suddenly sit forward or his eyes will light up when I speak about a rare spiritual experience of mine and he will retort as if he is a small child with lot of curiosity and interest to know more about such experiences

14. The footsteps of this person when he walks at his home were too soft, even feminine I must say, showing that he is a naturally soft personality which I appreciated in a man of his status

15. When I met him for the first time, he was sewing up some beads in position for his wife and he continued the job while he was talking to the guests and finished it in a natural way and handed over it to his wife showing a mastery over his normal household activities, his hospitality, lack of conceit and pride as well as his love for his wife in doing that small help for her, in front of others, though he is a celebrity. Probably it was that gesture which made me respect him more than all the media hype I had

read about him as a celebrity . A man who loves, respects and does small helps for his wife is not a macho idiot , my consciousness told me and I respected him for that .

16 He never showed a superiority complex in his relations with me or with any other person I know of

17...He mirrored my words and actions in his subsequent speeches and when he writes a good column in a newspaper asked me to read it , a week before it was in print saying that he has written something about a friendship that came quite unexpectedly and is giving him a feeling as if a rain of nectar (*amrithavarshini*) has fallen on him . This clearly showed how much he valued my friendship which was something offered to him , unconditionally , without expecting any thing in return from him

18.A touch is a powerful way to anchor a positive feeling . On my 60<sup>th</sup> birthday he gave me a very positive gesture by clasping both my hands in a friendly gesture .

19.The only negative gesture I saw in him was not related to our friendship but which was a telltale sign of his tension . He had a habit of fiddling with his hands/fingers while he is sitting on a stage with people around him giving speeches and thousands watching him. That was a physician's observation, not a friend's or of a woman's . And I knew the tensions he was undergoing from his own words in some informal talks .

Yesterday an old friend of mine (Dr Subhadra Ambikathmajan Nair) had forwarded a beautiful message (personality questionnaire) from Dalai Lama . It asked us to answer honestly 4 questions, writing them on a piece of paper . I think this is the best and the shortest questionnaire that I have seen for assessing one's own personality .Therefore I will share it here .

The message asks us first to make a wish before starting the questionnaire.

I made my wish as: *Loka samastha sukhino bhavanthu*: (Let the entire universe be happy).

Question number 1 was to arrange a group of animals provided in the message,according to our preference.

My order of preference I wrote as : Cow,sheep,horse,tiger ,pig

Question number 2 was to make a one word comment on each of the following: Dog,cat,rat,coffee,and sea.

I wrote as follows: Dog is very faithful;cat is cute,rat is clever,coffee is exhilarating,and sea is the energy of eternity beautiful forever.

The third question was to relate the given 5 colours (yellow,orange,red,white and green ) with a loved person each

I wrote as follows: Yellow is My Krishna,Orange is Sankaracharya ,Red is Durgadevi,White is Yesudas,and Green is my son and myself/my earthly family .

The 4<sup>th</sup> question was to write a number which you love most and a day of the week which you like most.

I wrote 72 for number and all days of week for the day of week .

Then the message said to make the original wish once again and see the answers.

The answers

Q1 : Cow stands for career, sheep for love, horse for family, Tiger for pride and pig for money. That was the order of preference that I had in my life according to the Tibetan mode of prediction of Dalai Lama . I must say that it is correct . Only contestants being love and career . I have often sacrificed my career for my love and family life .

Q 2: Dog represents our own personality and therefore I am a faithful person.

Cat represents the personality of my partner

Rat represents the personality of enemies (if any)

Coffee represents our interpretation of sex !!!! That I could not agree with. Because I never felt sex as an exhilarating thing , but coffee definitely is !

Sea represents our own life .

Except the interpretation of coffee everything seemed to fit in place very well especially the dog and the sea .

Q 3 : yellow represents someone you will never forget . I was so happy because Krishna is the one I will never forget in this or any other life .

Orange represents someone we consider our true friend and I had written it as Sankaracharya

Red represents the one we really Love and that was Durga , the Srividya/Tripurasundari .

White represents our Twin soul and I had written Yesudas . Green represents the person we remember for the rest of our life and that was my family and myself (of this samsara life) .

Q 4 : said we can send the message to as many number of people as we have written as our preferred number. Since that was not possible for me since I had written 72 (as number of Melakartha) and so I send it to 22 people (with which number of sruthi we make 72 melakartha) selecting them carefully . One person did not receive it . The other 21 received it .

The last message said that the wish we made will come true on the day that I had recorded. But I had recorded on all days and my wish was *Loka samastha sukhino bhavanthu*. Therefore I took it as a message of victory from the Tibetan head of Buddhism , the venerable Dalai Lama for my sincere endeavours for world peace and love and compassion .

I am giving this experience of mine to give you how an interested person observes even the minute movements of another as well as of oneself. A therapist has to develop this power of observation with each of the client for the desired effect to happen.

	ADVANTAGES	BENEFITS
FEATURES		
If one had worked on 100 persons	<p>More experience</p> <p>Knowledge of best practice</p> <p>Shorter learning curve</p> <p>Less chance of error</p> <p>Over a person who has just one case history/or worked on just one person</p>	<p>A quicker and more cost effective service is provided</p> <p>We are getting a policy input of ideas</p> <p>We feel secure</p>
Working with large hospitals/educational institutions/research centers etc with integrated medical care	<p>Wide range of skills</p> <p>Lots of resources</p> <p>Economic benefits for carrying out research</p>	<p>Easier/more convenient for us to have a one stop shop .</p> <p>Always we have availability of medical services of our choice</p> <p>Work gets done faster and hospital stay minimized reducing effort and expenditure from family</p>



Everybody thinks of Mozart effect when they hear about Music therapy . They have read about it in internet and therefore are familiar with that term. But what is Mozart effect and how did that term come to stay? Tomatis, a Medical professional tried Mozart in autistic spectrum disorders and found that the children show better response than to other types of western musical forms. And the method is called Tomatis method and the effect as Mozart effect .The greatest blame on this method and effect has been that it does not help develop or improve language in autistic children.

Probably the reason for this is the lack of vocal part in the music he used.

My method is Yesudas effect and Subbulaxmi effect . It is vocal music based on Indian Ragas. And it is a whole range of healthy and unhealthy people of extremes of age groups and adults, of both sexes and of at least four different languages over four decades that I have at my disposal for demonstration/proof of the effect . I don't know whether this can be called Suvarna's method just as Mozart effect is called Tomatis method who did research and therapy with Mozart effect.

What I did and how this started is important because it gives an idea of my method and its evolution over four decades that is ever since Yesudas started his singing career. I have been a born music lover from age 3 as far as I can remember and my first listenings were of M.S.Subbalakshmy, Chembai VaidyanathaBhagavathar, that proceeded to P.Suseela, Latha Mangeshkar and Mohammad Raffi , not to speak of P.B.Sreenivas, A.M.Raja , and other stalwarts of the time. .The experiments with music started on me and my study patterns (on concentration, memory) and then on the children (normal) of my own family like my brother, and kids who were given in my care by my cousins and sisters to put to sleep with lullabies. Then when I became a medical student and knew something about the peculiarities of human ear and of acoustics, and the physiology of nervous system I could understand some reasons for the effects of music on me and on children and adults .This became a real research protocol when my son was born and I studied it systematically.

Why people hear music?

The purpose of music listening is many and it is subjective.

1. Timepass
2. use as a background music while doing household chores
3. Hobby
4. Relaxation
5. Professional musicians critically hear to learn and improve

6. Out of genuine love for music.

7. as a research

In my case it started as a genuine music Rasika (music lover) by birth and then evolved as a research due to my inherent nature of questioning and search for truth, and then as a medical professional and a medical teacher and researcher it evolved as a system of music therapy .When you are a doctor naturally the effects of music on physiology and anatomy and neuropsychimmunology etc will be thought of and understood and experimented with. All these in a teaching profession made me think of a curriculum and syllabus and research protocols for study and treatment and this evolved as a programme .

I have given these details in four of my earlier books on music.

- Music therapy for administration, management and education.Readworthy publications 2008
- 2. Ragachikitsa.Readworthy publications New Delhi.2008
- 3. Naadalayasindhu (Raagachikitsaamritham) D C Books Kottayam 2008
- without a stumble. A book on spirituality of music .Nalapat books 2003

What is important with Yesudas that helped my research protocol: \_

- 1 One is the range of music he has produced.
- Second is the range of languages in which they are produced so that I can do a national level protocol.
- 3. Third is that he has popular music, devotional music (in all religions), nonfilm light music and classical Hindustani as well as Karnatic music for use in any range of population speaking any Indian languages . Among the popular music itself I could find people with a range of interests like Romantic, philosophical, poetical, humourous, children songs and devotionals and all these ranges from Yesudas alone. And for autistic children the use of Yesudas music has been of use to language recognition and improving language and communication skills most of the case histories from parents themselves.

The research on Yesudas' classical music and live kutcheris evolved out of these preliminary studies and free association surveys over several decades. The prospective research on kutcheris started in 1998 (since 12 years) and I have listened to 250 and odd live kutcheris of just this one singer for the sake of a research project on his music in these 12 years. I have a collection of many other stalwarts in classical music on several ragas along with that of Yesudas for this purpose. The reason for hearing live kutcheris

of a single musician as many times as possible is that it is essential for any researcher who wants to know about the many aspects of music and certain nuances of a kutchery which one learns not from books . For a person who spent time for time pass or for hearing music as a hobby and relaxation this may not be necessary. But for a researcher who uses the vocal music of a single person and do research on its effect on health of individuals and on society this is mandatory. To follow a musician's music is to follow his kutcherys and his recorded music as far as possible and have a rapport with him . An almost similar protocol was done on sufi music (khawali) of India and Pakistan by Regula Berkhardt as explained in her book "Sufi music of India and Pakistan".

The journey started first by understanding how my habit of hearing music for five minutes and then studying for 15 minutes and repeating the cycles regularly helped me to concentrate more and memorise more and what type of music helped me to do so. Later on I understood that the method is actually giving me five minutes alpha waves and then allow my brain to be more receptive again to what I learn in next 15 minutes when my beta waves work .

The use of 72 melakarthaaga for therapy, I base on its mathematical, astrophysical, musical, sine cosine wave functions and also on the philosophy of ayurveda, and yoga in Indian way of life. Thus it is an integration of several sciences and arts. It depends on sine wave and harmonics which is common to music, biocycles like cardiac cycles (which is also 72/mt incidentally) and astronomical cycles. The Doppler effect as described by Sankaracharya and the other scientist/philosophers before him in India had helped them to develop the harmonics of sine waves of music to control sine waves of blood circulation and to develop *Naadalayayoga*. To prove this a pilot project was done at Amrita hospital and it was successful statistically .

Hence my method use the principles of medicine like:

- Doppler effect in cardiovascular system flow
- 2. Principle of EEG in transforming beta waves to alpha waves or meditational waves
- 3. All stress and strains and tensions of life-professional, domestic and others- cause several disorders which are somatic. All these can be treated and prevented by music which reduce stress and strain
- 4. Psychoneuroimmunology
- 5.Both prevention and cure of disorders
- 6.At extremes of life and in people with and without mental retardation and with or without memory loss one can use music but the principles of use is different in each
- 7.In narrative medicine and family medicine
- 8.In cancer and heart disease and also obstetrics and gynecology
- 9. In surgical wards
- 10.In traumatic head injury and coma
- 11.In educational institutions
- 12.In professional life

- 13. In integration of all branches of medicine for proper healthcare of society
- 14. For world peace
- 15. In therapy for rapport
- 16. I think that this can also be used in agriculture for better food production and in animal husbandry since music has no boundaries between anything and anyone. I haven't done research in that field but assume that it is possible and if anyone from these fields can start a programme of research it would be good.

It is not just an adjunct therapy but a golden thread which integrates all branches of sciences and arts, especially for integration of all branches of medical care

Thus the use is from lullaby to deathbed and the method is cost-effective and without side effects if used judiciously

I understand that God had made me an eternal music lover by birth, and a medical teacher by profession, just for doing good for society, for humanity and for the discipline of music therapy so that I am made to develop this method for education, health and integrated approach for all sciences and arts for peace of individuals, society, nation and the world.

Ref: Regula Berkhardt "Sufi music of India and Pakistan".

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## **Chapter 21 .Acoustic experience-The aesthetics of music and making dreams into music**

Visualisation of music in Music therapy is a dream-like aesthetic experience. How this can be achieved and how scientific is this method? What is the history of this procedure ? These are discussed in this chapter.

Most of the people are living among noise and hence have no time to rejoice in voice , or they are denying the voice . The philosophy of music is the oldest branch of aesthetics in India. It starts from the Vedic literature (in written/oral traditions of saamveda) and then through Mathanga and Bharathamuni , to AbhinavaGuptha and the Thanthric exponents of music. In the west it originated from Pythagorus (Akousmathic kori) and Plato , Ptolemy , St Augustine, Plotinus, Boethius, and poets and philosophers of middle ages and is a comparatively recent tradition . In the west Kant and Hegel were two giants of aesthetics. Rebirth of aesthetics happened in 18<sup>th</sup> century with John Mattheson and Charles Batteux, after the Europeans became established in Asian colonies.. In India the tradition of classical music became very vibrant at the same time, because , the Europeans who came to India were enthralled by the tradition they saw here, and wanted to recreate it in their way in their homeland.

Those who want to hear the voice , imagine a room where in the silence a permanent voice is heard . (Om /or any other pleasing note /in your pleasing preferred voice). Or in silence listen to a soft Thambura, or to the wind, ocean or a bird's call. With these one can also hear an inner voice which is far from the maddening crowd of everyday noises.

Sounds are either events or processes. How to distinguish them. ? Only processes are enduring. Events happen at a specific time. Processes last through a time. An event makes a change in the world. Process last unchangingly . Thus the beginning and end of a process is an event. Some sounds are events . Some are processes. Aristotle called them actions and passions. Our worldview is dependent on three applications on the concepts of identity. Sound as a pure event with a beginning and end. The soundspace when a sound saturate our hearing and draw out all its competitors. God's earview of things we obtain from music. This is how I listens to my own inner voice, or to God's presence through music.

Music makes use of a particular kind of sound .When we hear music we hear not only the sound but something which moves with a force of its own. This intentional object of musical perception is the tone. Exploring the relation between the sound and tone describes our musical experience. Because of this Leibniz called music as a kind of unconscious calculation . (The unconscious/superconscious nature of calculation is its only difference from astronomical calculations/or from the conscious efforts in yoga to make mind concentrate.). Music's nature as an art of sound, a new way of understanding music which has character of aesthetic , accords music the status of a narrative.

The representational nature of poetry is the medium of language by describing things according to pre-established semantic rules. If sounds of music is put to a linguistic use (literally to a musical language)

this music is capable of representation. It would be poetry written in a language of absolute pitch. (a kind of superlative tonic language). Hence such poetry is nothing but sound itself. We find this in traditional music of India. Then it will be a single act of attention in which both music and its subject matter are heard and the description of the subject is unfolded through music , just as in painting. When we hear a *Annamacharya krithi* or *Tyagarajakrithi*, it brings the music as well as the form of the deity they worship with all its attributes. Thus visualization of music as part and parcel of healing exercise in music therapy had been in use from time immemorial in all *Bhakthysampradaaya*..

The crucial difference between an acoustic and visual appearance is that in visual , we cant see without attributing it to something. Whether it is a woman, a horse, nature , deity a visual appearance present us with an identifying description of that object. Hence for visualization of music such a method is used by the ancient composers of India who were singers/composers/philosophers/yogins rolled in one. The expression and representation are thus different or distinct , and the term expression means artistic meaning compared with our states of mind. Meaning of a work of art is available only through its particular expression in it. The expression of a *Tyagarajakrithi* takes us to the states of mind of *Tyagaraja* and if it fails to do so, with a particular performer, he has failed in expressing that state of mind. This is especially true in *Bhakthy* traditional music of India which has a special aesthetics of its own. Cadences are integral parts of tonality or an integral part of experience of structure and form. The bass voice persists in tonal music as an independent melodic line because harmonics rest on bass line.and are heard in relation to it. Triadic tonality forces bass into prominence matched only by the principal melodic voice and melodic constraints automatically apply to it. Just like earth which is the basis of everything, bass voice sustains , establishes , strengthens the others.

Music is organized but not the same way as language is organized. Musical experience can be amended and deepened without losing its distinctive intentionality .This happens with practice and experience. This probably is what Jesudas means when he says music should evolve with time. Music is organized at three primary levels , the rhythm, melody and harmony.

In any planned activity in business management we have a tree diagram of decision tree.

The successive decisions form a tree structure.(The aesthetics of music .Roger Seruton.He uses the terms in business and marketing ways.)

Enter market			
Import product		Manufacture locally	
Build manufacturing unit		Acquire a unit/factory	
Import	Local staff		

staff			
	Train abroad	locally	
		Bring instructors	Local instructors

Same kind of decision tree in all rational actions whether it has an aesthetic goal or not. Music production also has the same rules when it comes to marketing and making music..I would have preferred a simili related to Educating the people about the aesthetics of music rather than entering a market as Roger Serton has done .I cannot attach marketing to a divine musical activity .

To listen to music with understanding is to relate by a conscious route where the composer subconsciously derived it. The recuperation of it also is subconscious in listener and musical analysis makes it explicit. Hearing the structure is part of the phenomenology of musical perception, rather than a matter of influence or analysis.

Aesthetic interests are insatiable interests. Each time we listen to a musical piece we find something new in it. An experience to which we are repeatedly recalled is an experience of value . Aesthetic value is a form of intrinsic value. Because there is aesthetic experience , there is an aesthetic value. If no experience no aesthetic value either. The science of sound does not say anything about the tonal space , musical movement, language of tonality. Music is absent from the scientific theory of the world. Musical analysis occur in the following contexts.

1Psychology of musical perception . A branch of cognitive psychology

2.Musical analysis an attempt to describe music of aesthetic interest and to show how tonal surface is constructed. This is a controversial practice. The music should come from or emerge in the perception of listener. The structure is real only if lived by the listener. It is person-oriented.

3.Music criticism. The good and bad in it and just what it means.

4.Musical aesthetics which is a metastudy. It is a critical discipline . Describes the nature of and the limits of our thoughts about music. These four practices usually overlap.

Making and listening to music are social with religious/spiritual/ceremonial connotations. Silent listening is a primary musical experience . Public performance always keep the listeners silent. In private

performance (recorded music) music is separated from the social context for the time being. Making music together is a social event , a nonsemantic communication , a mutual tuning in relationship. Barrier of I and U transcend to the realm of we. A human being is an assortment of raaga , and when it is sung properly , it gives pleasure. If sung improperly it creates problems in society. The story of Narada singing the raagaas improperly and the raaginis becoming lame is symbolic of it. If the people have proper music right from childhood, and in a definite orderly way, they will be happy and healthy is a message from that story.

In the book ,The way of the white clouds (A Buddhist pilgrim in Tibet ; Lama Anagarika Govinda . Shambala publications California 1971) Tibetan music is based not on melody but on rhythm and pure sound value. Man is in connection with a universal background and not in solitary existence. The sounds that come from the womb of the earth, depths of space like the rumbling of thunder etc are always with him. Mantra is a sound of nature. Music symbolize the vibration of universe. The effect of gradual swelling and ebbing of oceanic tides , and the breeze of individual life creating and playing with the multitude of cosmic waves and wavelets and the sound of the all-encompassing OM, the prototype of all Mantra sounds is the basis of Indian and Tibetan music. (See Thantric and Mantra texts and Upanishads) The human bass voice represent the primieval cosmic sound and experience of infinity of space. The drum , the infinity of life and its movement. Or what we call the dharma eternal (sanathanadharma). Budha after his enlightenment uttered the word Amrithadundhubhi (The eternal drum of immortality ) which he heard and he wanted to make it heard throughout the world. When Teravaada budhism of South considers music as just a sense pleasure, Tibetan Budhism considers it as the eternal cosmic truth. In Tibet the ways of contacting the deeper layers of mind are

1.Dream visions

2Meditation

3.Trance

4.oracles

5 natural and supernatural psychic portends

The vastness of space, the solitude, and the silence of nature around act as a concave mirror that enlarges and reflects our innermost feelings and thoughts and concentrates them in one focal point , our consciousness and in such moments the best divine music is born within us as a inner voice of silence.

The first chapter of the book Dreams (Dreams –A reader on religious cultural and psychological dimensions on dreaming.Ed Kelly Bulkeley.ch 1.Budhist dream experiences by Serenity Young pp 15) speaks of women and female deities in men’s dreams. They bestow supernatural powers that lead to enlightenment. To complete the quest they have to depend upon a female guide , win a goal or achieve enlightenment and wisdom (pragnaa). Pragna is feminine in Asian traditions and personified as a



semidivine woman . Sankaracharyas soundaryalahary on seeing the devi and Kaalidaasas story are musically and visually aesthetic .

Women are good dreamers. The musical dreams of women are very beautiful and predictive too. The women have conception dreams like that of birth of Christ and Budha by their mothers . A paali text Saardoolakarnaapadhaanam is on dream interpretations. In Bible we find dream interpretation of pharaoh by Joseph. *Kathasarithsaagaram* deals with dream interpretations of the Hindu and Budhist lore, all before Freud and Jung .All tribal people had dream interpretations of their chieftains for safety of tribe. The dreams of women are being interpreted by men and this gender difference is the cause for fallacy according to Kelly Bulkeley. Ability to interpret dreams is a tremendous source of spiritual and temporal power and only very few people understand their own dreams. Dream is a passive nonheroic form of activity best performed by a female or a junior male. Budhist heroes dream internalizing this female power and at the same time maintain their male power as interpreters of the dream. In *Lalithavisthra* when *Gopa (Yesodhara)* wake up and tells her dream to Budha, it is Budha who interprets it, not *Gopa* herself. He was *Vesanthara* in last birth and *Gopa* was *Maadi* and *Maadi* had a prophetic dream .(*Vesaantharajathaka*). Women are powerful dreamers and have prophetic dreams. But powerless to fulfill them since they are not allowed to interpret it themselves. *Padmasambhava* discuss the dream of his wife *Bhaasadhaara* . In Milerepas biography *Marpa* discuss the dream of wife *Dakmena* and interprets it. The root of it is the dismissal of the male Budhists of real women from the monastries, and internalization of imaginery women . The incorporation of female imagery and female deities and distancing of actual women happen in Budhist *thanthra*. Women are sworn to secrecy as silent participants of their *thanthra* .The rarity of female biographies on *yogic/thanthric* experiences in spirituality is because of this gender difference.(pp 17 ibid) The dreams of *Kannaki* and of *Devanthi* in *Chilappathikaara* (*sangham* period *Tamil* epic) on the other hand are not interpreted by men but by themselves and no gender dominance seen in south . The dream speaks to the individual dreamer but also to all those who hear them.

*Saamavidhaanabrahmana* edited by A.C Burnell (London Trubner and co 1873 ) recommends certain things to have a prophetic dream.

One among them is to put the deity *Sankarevaasini* (may be *Parvathy*) in a basket full of unhusked grain, incense, and flowers and putting it to the headend, lay down in a sacred pure place with head to east . Sing the hymn from *saamaveda(imam uhuvu)*. Remain silent while falling asleep. One will see as if in a film the *phala* or fruit of what is to happen (future prediction). The dream *chathan*(Sanskrit *Sasthaan/saasthaa*) made in the temple of devi (the present *Ponnambalamedu*) in *chilappathikaara* is almost the same procedure. This is the birth imagery of devi. Another is death imagery in which one puts a box with *garagoulika* a powerful poison in it and sings *aayaahi susamaahitha* , the *saama* hymn. This is death imagery. The term *swapnamaanavaka* (the student of dreams) is seen in a 12<sup>th</sup> century Budhist text on constructing *Mandalaas* . ( Jung had his Mandala theory of dreams from this ).The text is *Vajraavaleenaamamandalapaayika* by *Abhayaakaaraguptha* translated to Tibetan and it is a method of watching a dream and finding out whether its deities allow the *mandalasthaana*. In Mesopotamia and in Hebrew Bible and in Egypt stars and animal viscera constitutes the writing of Gods. The sacrifice of Ismail is done according to a dream. Prophet Mohammed receives information in dreams. He saw twice

in dreams an angel covering Ayesha in a cloth and carrying her. This happened before he actually saw her and married her. One of God's sign is the *manaam* or dream. in night and day. Right dream come from God and impure ones from devil. The analogy with death is seen in the words "Men are asleep. When they die they awake". In ancient medical texts of India red women and blood in dream predicts death. In *Brihadaranyaka Upanishad* (4.3.13:38 and 4.4) discussion on sleep and dream leads to discussion of death.

Dreams have memorizing power. The memorizing of texts (Koran , Geetha etc) seeking help in making a choice /decision (*Ishtikara*) and transformative potential a dream has on dreamer are noteworthy. A visionary with heightened awareness get dreams of visions .Young girls and young women has this power without any previous preparation. Especially when a relative /a dear one dies.(says pp 97 of the book) which I absolutely agree since I had my first vision of Devi in a sparkling golden ocean , in a mandala of light and music , at the age of 8 when we had two deaths in the family. The power is more during menstruation and there is a period of latency between the dream and its actualization. The Lakota holy men compare the power to a medicinal plant . When all the lifeproducing stuff is over the wisdom is in the root if they work with the medicine in the right way. They call a woman who has this power a bluebird woman , who can bring a voice to sing during her sleep. The blue bird of Krishna was awake in me when I lost my grandmother , his best devotee and my granduncle , a *gnaanayogin*. Artists , medical people and spiritualists had this bluebirds power within in the ancient world , partially or wholly.

#### Making dreams in to music

Contemporary song writers carry on this ageold dreaming tradition with them. (Nancy Grace). Billy Joel at Berkeley college of music in Boston said "All songs come from my dreams"Paul Mcartneys album Lazarus heart, colvins poleroids from his album fat city, confessions of a blue singer by Rory Rock all came from dreams. So, when I say that my poetry came from my dreams and my music also I visualized from childhood dreams, there is nothing unusual or supernatural about it. It is just a natural phenomenon within me. Just as a flower comes out of a plant , they came out of me in right seasons, right times. That is my interpretation of my dreams.

Jane white Lewis reflects on the Jungian analytic practices of dreams in chapter 10 of the book and says dream is finding the truth within and dream work as a spiritual discipline .It is a spiritual alchemy , an instinctive response to deep pain and injustice and *viraha* in a lover's quarrel. A highly emotional stage of a lover's *viraha* and a yearning for the lover/God happen and only then a person's spiritual perspective reaches the darkest and the most distressing phase and transformation into truly authentic and reliable spiritual perspective emerge as pure gold. The dreams of scholarship are very interesting because many discoveries and inventions and abstract truths have been discovered /revealed in dreams, like that of Ramanujan, Kekule, Jung and Poincare. The creativity is not only mystical and artistic but also scientific in dreams. And creating a new thing is actually practical dreaming , making a waking dream as

in the *thanthric* twilight practices. We create in dreams whether asleep or awake. Sometimes metaphor structures a dream . In love a bridge dream means Love is a journey . In a flying dream it means a sense of freedom experienced by the dreamer.

In his book , Implications for psychoanalysis , The new neuropsychology of sleep, J.Allen Hobson says that dream emotions like anxiety , fear , anger, elation are primary shapers of dream , not reaction to them. The classic anxiety dreams are feeling lost, not haing proper credentials,or adequate equipments, suitable clothing, or missing a train etc.

There are functional deficits (physiological) as loss of noradrenergic and serotonergic modulations in REM sleep. These neuromodulators are essential for learning, memory, perception, attention via their direct CNS effects and indirect peripheral mechanisms. In NREM sleep these are not decreased . In REM neuropsychology what we get is certain hyperassociative quality and instability of the timespace , place and the person – a qualitative feature of the REM dream. The dream characters are thus a chimera , some features of the dreamers self and some of another. Even the sexual identity of dream characters is fluid. A person gives longer more vivid more motorically animated more bizarre accounts of the REM than the NREM. There is some degree of dream amnesia and the narrative need not be complete. The cognitive and scientific dreams of the dreamer must be then coming out of the NREM phase and the narrative we get are only very few and only from exceptionally scholarly minds and probably that is why the tribals considered only their chieftains dreams worth reading and analyzing.

In narrating a dream there is a selfreflectiveness (SR) defined as examination of ones own thoughts, feelings, behaviour . SR involves duel levels of awareness alluded to as experiencing the self immersed in its own pattern of awareness and the secondary level of awareness examining the experiencing self. (pp 333 ibid Tracey L.Kahan quoting Rossi 1972:139). She approaches dream as a metacognition.

Metacognition is awareness of ones own cognitive processes and a deliberate direction of ones thought processes. Thus both selfreflection and intentionality of self regulation are in it. One part of our mind tells the other parts where to go (intentionality) and observes its progress (selfreflection or monitoring) and corrects its deviations (regulation) if any . Usually when we think in dreams such metacognition is absent . But metacognition is present in sleep and in lucid dreaming.(Godwin 1994;Green McCreeny 1994;Laberge 1985;Van eaden 1913) and high order of cognitive skills do occur even in nonlucid dreams (Cartwright 1981;Cicogna 1991 q pp 341 -342 Tracy L.Kahan ch 22 Ibid ). To have a dialogue with the skeptics she gives a spectrum of perspectives on dreams and dreaming as below.

Theological	spiritual	Paranormal	Scientific
Dream instructions and prophecies from Gods as in the Prophets	Higher meanings encoded by a higher power/deeper self	The facts transmitted at a distance through dreams by unknown means	As functional activity.Consistent with known laws of nature .

In my dream analysis I combine the spiritual and scientific approach predominantly and sometimes even feel that there is something unknown transmitted in it from a higher power which may be called unknown, just as our deeper self which also is only partially known. That cannot be named since it is unknown or partially known .

How scientific is a dream consolidation?

When in jagrad or waking state the sensory inputs are fed to association areas in cortex and hippocampus. Acetylcholine is high during waking state. It prevents the feedback of signals from hippocampus to cortex , so the information is kept separated or not merged with other incoming stimuli . The advantage is that there is no distortion of information. The disadvantage is that there is no integration or synthesis of knowledge. But this is overcome by the linking together of input information by encoding . (See the previous chapter of memory and amnesia for the figure of Visual cortex. The same happen with auditory cortex).

In *sushupthy* or dreamless sleep, acetyl choline levels falls, and the EEG become more in a meditative state, and the newly encoded memory in hippocampus is allowed to be fed to association cortex. There is no new input at this stage .(page 129 .Beat memory loss.Rita Carter.Cassell illustrated.Octopus publishing group.2005) Sleep is a sensory blockade or *chithavarithinirodha* as in meditation/*Samadhi*.The feedback from hippocampus retriggers neural patterns activated during previous waking . Thus the heard, seen and experienced are consolidated with its meanings . The new linkage forges a new connection between the concepts . So when it is wellconnected , it become synthesizes as a whole. When one of them is triggered all others are also triggered. Thus heard music, the visualized sight, the experience of emotion, and the meaning of it become integrated. This consolidation is what is happening in *sushupthy* . This is a normal , not a supernatural thing to happen. But for me to have an interlinking of music, philosophy, astronomy, medicine and language and literature I should have an interest and *sraddha* in them in my waking state. But the question of how I got the experience while I was only 8 years still is an enigma to be explored .The *vaasana* of a previous *janma* in a cyclical universe was thus reasoned out by ancient brains .The phylogenetic memory of modern scientists is akin to this .

The new scientist (28<sup>th</sup> May 2005)reported a few things for betterment of brain conditions and memory power .

REMEMBER	FORGET
Glucose	Fatty foods
Music	Excess alcohol

Word associations	Sleep deprivation
Exercises	Poor hearing
Chewing gums	Bad eyesight

I am happy to understand that I have all the best things needed for remembrance /memory power (except chewing gums) and do not have the things which make me forget and hence my brain is in a fairly good state of memory and cognition and probably that is why I remember my own dreams so well and can interpret them and analyse and do selfreflection as a metascience of my own consciousness. And what is after all spirituality than selfreflection and knowing the self? Hence making my dreams into music and music therapy was written in my brain and in my dreams and in my life's plan itself by God or by the natural Law . As a person who believe in the rhythmic orderly nature of cosmos and its laws I don't find any supernaturality in what I do or think. It was predestined harmony as Leibniz says. Or in better terms, a God-given gift of *Saraswatham* ..

1 The aesthetics of music .Roger Seruton

2 A Buddhist pilgrim in Tibet ,Lama Anagarika Govinda .Shambala publications California 1971

3 Dreams –A reader on religious cultural and psychological dimensions on dreaming.Ed Kelly Bulkeley.ch

1.Budhist dream experiences by Serenity Young pp 15

4. Saamavidhaanabrahmana edited by A.C Burnell(London Trubner and co 1873

5. Brihadaaranyaka Upanishad (4.3.13:38and 4.4)

6 Jane white Lewis Reflects on the Jungian analytic practices of dreams in chapter 10

7 Implications for psychoanalysis ,The new neuropsychology of sleep,J.Allen Hobson

8.Tracey L.Kahan quoting Rossi 1972:139

9. Godwin 1994;Green McCreeny 1994;Laberge 1985;Van eaden 1913)and high order of cognitive skills do occur even in nonlucid dreams (Cartwright 1981;Cicogna 1991 q pp

341 -342 Tracy L.Kahan ch 22 Ibid

10. page 129 .Beat memory loss.Rita Carter.Cassell illustrated.Octopus publishing group.2005

11 The new scientist (28<sup>th</sup> May 2005)

## Chapter 22.Complementary and alternative medicine-Discovering India's past

Complementary and Alternative Medicine are two terms used synonymously for practical purposes. When we ask the question Complementary to what ? Or alternative to what ? We get the answer to Western Allopathic practice of Medicine. This term , therefore, accepts western modern medicine as the principal method of treatment . A better term is Integrated Medicine where we can use all types of medical practices simultaneously or side by side depending upon the need and the situation concerned .

In India if we take a survey , we will find that over the past 400 years western medicine is taken by population in general, but still the ways of life, the food and the systems of indigenous medical practices go hand in hand in each and every province and it has never been disrespected by people , whatever the Modern Medicine doctors think or say about these practices. In fact the acceptance of Modern Medicine alone as Scientific was due to the mass propaganda which started from 17<sup>th</sup> century onwards and still continues. In 1995 a survey in UK showed 9000 subscribers (surveyed) were taking alternative medicine at least once in their lifetime and a survey in 1995 showed people wanted complementary medicine introduced in NHS . The several reasons for the popularity included the side effects of modern drugs like NSAIDS (nonsteroidal anti-inflammatory drugs) to relieve simple pain. Another source of dissatisfaction was long waiting time for treatment and lack of time of busy medical practitioners and their attitude to patients. That is both the type of treatment and the approach of the practitioner were causes for its unpopularity in Britain. The same was true of America. But the main reason for acceptance of other systems of medicine in these developed countries was the research which showed that they are equally able to heal several disorders. It was not just disillusionment with modern medicine but also the effectiveness of the other systems in real life practice that made it very popular in developed countries. A holistic approach to nature, energy and integration developed as a result of these studies.

In 1986 BMA had dismissed all modes of treatment other than modern medicine as “primitive beliefs, outmoded practices, almost all without basis.”. But 7 years later BMA was thinking about new approach of accepting other types of treatments also for good practice. In 1991 NHS had complementary medicine accepted into its practice. Foundation of Integrated Medicine (FIM) analysed primary care group (PCG) plans for complementary medicine from 1999-2000. As more and more PCGs became PCTs or primary care trusts that manage and control their own budgets more opportunities for such integrated medical practices opened up. In 65 % of British hospitals doctors have accepted the role of other modalities of treatment in mainstream medicine. In residential homes this has been of much use.

Integrated services are set up and run as collaborative for people , that is both types of therapies are given side by side . The initiative of establishing a learning collaborative and in participation with a university provides a support and information network. Its aims are to support joint learning between a set of projects representing different models , to find out the steps and resources, to develop resources that can be used by others seeking to develop integrated primary care (especially knowledge and information about the several modalities and how to use them in integrated practice), to gather evidence about successful models and development strategies and to share the learning from that work with a wider network of people.

The Foundation will have to provide support to the various projects taking part in the collaborative in a number of ways.

These include among others:

- 1.Funding for participation in seminars
- 2.Towards cost of development activities and their evaluation
- 3.Expert advice on service development
- 4.Models of integrated working and evaluation strategies
- 5.Information about possible sources of funding
- 6.Relevant research on effectiveness of complementary therapy in primary care.
- 7.Standardising ,accrediting ,validating the training courses with an ethics and code of practice
- 8.Continueing professional development

The best organizations should have a set of validated , accredited, educational training standards, a code of practice and ethics, an accessible fair and effective complaints procedure, open disciplinary procedures and a requirement for indemnity insurance.

FIM was established in UK in 1997 as a result of initiative of Prince of Wales. NCCAM is the national center for complementary and alternative medicine in USA. In Kerala , it is proposed to have an integrated medical practice quite recently but is not yet implemented..

#### WHAT A THERAPIST SHOULD KNOW

- 1 what are methods that one use
- 2.What is the basis of the process with which the treatment works

3.what type of disorders have effect with this

4.How many sessions one needs depending upon one's condition and one's temperament to the treatment modality

5 Am I having enough training in the process to start treating a patient and have I got attached to an educational training institute for the purpose

6.Is the modality that I give cost effective and free of side effects

If these questions are analysed by oneself and if one is able to answer these from experience and practice one can be considered a good practitioner. One has to understand the limitations of one's profession, of oneself as a human being and also about the differences in each patient/individual as a unique one. What works well for one need not work for another and therefore a variety of treatment modalities under a common umbrella of institution helps a lot. The Umbrella organization under which the modalities come has to give definite directives for all these.

We must understand that western medicine evolved after Europe had access to India directly. The Portuguese, the Dutch and the French came and learned a lot of Indian medicine and its regulated nature . Then there was a renaissance in entire Europe . The first Medical Act of 1512 in Europe was the attempt to regulate the medical profession. It is also interesting that the license was first given by the bishop of the Diocese in which the practitioner lived. (Just like the Indian system of the *Brahmin Guru* of a region .See *Susruthasamhitha* for the licencing and accreditation practices of Indian Medicine). In 1542 it was amended and is called the Herbalist's charter supported by Henry V111 . This was designed in protest to physicians and surgeons who allowed the patients to rot, unless they pay heavily. (That shows the business mercenary attitude of the first western doctors ). The charter allowed any one to practice if they have knowledge and experience of nature of Herbs, roots and waters according to their cunning (Cunning meant ability) experience and knowledge . This right of practice freely and legally was guarded and by herbalists and supported by Government. For four hundred years this persisted . In 1977 The Herbal remedies order defined the circumstances under which a herbalist can prescribe certain toxic drugs like belladonna.This classified Herbal medicines as three categories.

Licensed

Unlicensed

Food supplements

In India all herbs are used as medicines . And most of them are food ingredients and fod supplements . Therefore only a few prepared mixtures come under the licensed category .If we insist that all herbs should come under license , even rice and wheat will have to be licensed because *Ayurveda* use each and every food item as *Oushadi*. The argument that each drug should be submitted to a RCT is therefore inapplicable in India and in all geographical areas with great biodiversity . Jeevaka ,during Budhist period



declared that there is no plant/herb without medicinal properties..Then people wont be able to take any food and will die of starvation before the Government certify and give a licence for it. Therefore we have to be practical in devising rules.

There is no problem in finding a theoretical issue and experimental design for research in complementary medicine . The most important issue is the lack of funding and the lack of research skill as far as music therapy in India is concerned. This I say from several years of experience . People are interested in the discipline but do not know where to find an institution where they can do proper research under a proper guide . And the so-called self-proclaimed music therapists are not able to answer the several questions the students ask or the doubts the public have. Systematic reviews and metaanalysis are not coming up simply because of this barrier. I have been trying to give awareness on these matters both to students and public through several communication media .

What we need is an environment that supports and values the development of research skills and experience , enable access to research training opportunities and resources to undertake research activity , provide secure and attractive career pathways for our new generations and encourages development of high quality research projects. An important point I want to stress is Music research and music therapy research are different .Training in classical music or light music singing is not training in music therapy. It is only part of the entire integrated process. Just as one limb cannot make up our entire body , music alone does not make up music therapy . But that limb is definitely very very important .Everything has a place and a design in our system. Just like that recognize each knowledge system in its own unique way and give it its share .

#### Discovering Indias past

Gunnar Myrdal wrote in her preface to the Asain drama:’ Often the simplest way of explaining what a book is about and what it aims to achieve is to tell why and how it came to be written “ (The Asiatic society of Bengal and the dreaming of Indias past 1784-1838-O.P.Kejariwal oxford India paperbacks 1999 preface). In finding out Indias past I have been going through various disciplines and among them one is music . Sir William Jones the founder of Asiatic society in August 1787 wrote to his pupil the second earl Spencer : I have many discoveries to make in the music of India. In the year of Vikramaditya , nearly 2000 years back , the art flourished in the country,...These enquiries go beyond the mere gratification of curiosity . They may suggest improvements in our own musical systems.”. (Also quoted by Gerry Farrell 1997 pp26). He studied *Sangheethadarpana* of Damodara, *Ahobhilaa’s sangheethaparijatha* in its Persian translation, and *Somanatha’s Raghavibhoda* and *Sabhavinoda* for this purpose. On November 11 , 1790 he wrote:’On musical modes of the Hindus “ and published it in the 3<sup>rd</sup> volume of researches of Asiatic society , the first European to publish a comparative study of Indian music. According to Willford Egypt , countries bordering the Nile, Africa had numerous settlements of the Ahirs or shepherds

, as they are called in the local spoken dialects of India and they were the settlers who migrated during Krishna's lifetime. (And incidentally that was the time of the Harappans golden period.) According to Jones "The whole of Newtons theology , and part of his philosophy may be found in the *vedaas*" (pp 73 ibid)

According to Gerry Farell (Indian music and the west .Clarendon Press Oxford 1997 ) since music and strucutre of music in India was obscure to the west they first brought it to a form of representation . Western scholars and musicians of the 18<sup>th</sup> century continually grappling with the problems of notations, intonations and tuning were at a loss and they found William Jones book very helpful. Indian music was being discovered and rediscovered by orientlists, musicologists, gramophone executives, parlour song composers and singers of popular music of the west continuously , ever since. 200 years after its appearance in academic circles and in the popular consciousness of the west , there still remains a lot to be rediscovered . As Jones put it Indian music was more perfect than the Greek, copious than Latin and exquisitely refined than both. In 19<sup>th</sup> century the British was trying to understand the notations of India and they noticed the human as well as musical diversities in the country and was trying to collect as much of knowledge from each region. A *gayan samaj* was formed for this purpose. This body wrote in 1883 (At that time *Swathi Thirunaal* was the *Maharaja* ) to *Maharaja* of Travancore asking some questions about notations used by musicians and to know whether English melodies were included in their repertoire. The *Maharaja's* reply seems interesting. The *Maharaja* wrote back that there is some difficulty in notating some sections of the performance such as the *Raagam* equivalent to the North Indian *Aalaap* because of its free nonmetrical structure and the microtonal intervals sometimes involved. He also wrote that musical material being reshaped anew in each performance, he can try to notate some simpler melodies to the help of the British bandmaster of the *Nair* brigade which contain some of the best musicians available there (pp 73-74 of ch 2 Gerry Farell).

This is interesting because of the following reasons

- 1.He mentions the difficulty of notating the free *aalaap* style
- 2.He acknowledge that music can be reshaped according to need and there is no harm in using the English song but with Indian notations made by the musicians of the *Nair* brigade who will help the English bandmaster to perform them.

This is not what was done in Mysore court. The European band played Indian music and the Indian band the European music with western orchestra under Defries the European bandmaster in Mysore.

- 3.When he says the *Nair* brigade and its best musicians he may be referring to *Irayimman Thambi* and the contemporaries.

When the gramophone came to India Indian music was recreated to fit the western ideas of marketing (pp 113 ibid). Music became a saleable commodity . The first recording of Indian music happened on Saturday 8<sup>th</sup> of November 1902 by two dancing girls of the classic theatre Soshimukhi and Fanibaala.

Recording was done by Feed Gaisberg with a portable recording equipment and a weight-driven motor. Later the recordist came across Gauher Jan (1875-1930) at the residence of a wealthy Babu and this vocalist became the first major recording artist of commercial classical light music of India. This girl was of Eurasian origin brought up by her mother in Benarus and later converted to Islam. A student of Ganapathi Rao (1852-1920) she was trained in *khayal*, *Thumri*, *drupad* and *saadia*. She charged 1000 Rs for a recording session. Later Janakhi bhai charged Rs 3000 per session. The first male singers recorded were Lakhand and Faiz Khan and both sang in hyperpitch as females. In 1907 catalogues the ubiquitous HMV picture came into the middleclass Indian household. The HMV trademark shows the dog sitting on floor, beneath the gramophone on a table, the corporate trademark with social, political undercurrents in meanings. The gramophone is the object, a possession, a bridge between two cultures a symbol of aspiration of Bourgeois society, of technology that cross generations. The streetdog that became clean and touchable, the black servant of technology, and submissive to status and power sitting humbled but still enjoying the position of underdog and given a white colour of the master (pp 131 *ibid*). I don't think such meanings existed in that symbol. Such theoretical constructions of meaning make friendships and understandings between people difficult. It was just a picture showing that even a dog, an animal without musical sense enjoy the beauty of music. None of the sociopolitical constructed meanings given by the author of the book, exist.

According to me, there is one more implication spiritually. The dog understands its master even if the master comes in disguise of a woman, beggar or prince. Similarly a true *bhaktha* recognize God in any form/disguise and the true *rasika* recognize good music in anyone irrespective of caste, creed or sex or religion. Instead of interpreting it that way, the bourgeoisie Marxist view of the two classes is being imposed on that poor dog listening to music/voice of His Master.

From the story of how Jone Williams of Asiatic society of India and the Kings of the princely states of India taught music to the European white masters, the simile of a black dog and a white master does not hold good either. It was the Black Indian music that became modern western music being adapted from the underdog by the masters.

Ref: 1. The Asiatic society of Bengal and the dreaming of India's past 1784-1838-O.P. Kejariwal Oxford India paperbacks 1999 preface

2. Gerry Farrell: Indian music and the west. Clarendon Press Oxford 1997

In India music and dance and arts has a ritualistic background whether tribal or Vedic. When I speak on the cultural heritage of Indian music and arts , someone was asking me “Are you promoting Hindu religion?”

When I was speaking about the classical music and its effects on the health of my clients , then also someone asked me “Are you promoting Yesudas?”

I don’t know the meanings of both these questions. Because both questions negate each other .For one thing there is no need for a person like me to be a promoter of either Hinduism or of Yesudas. Both are already famous and accepted by a very large section of society. Hinduism for generations of people for millions of years, and Jesudas for the last 50 years . The second aspect is that if any one who does research on Indology is a Hindu Fundamentalist , then it is better to be that rather than doing no research at all on our past history of heritage and culture. The third aspect is that if I am promoting both Yesudas and Hinduism at the same time , that is an impossibility , as any fool can see from the first glance itself. One cannot promote Hindu Fundamentalism and Yesudas simultaneously .And for a person of my caliber who had commented upon the Vedic and Thanthric Prasthanathraya the greatest Indian philosophical systems , promotion of a person (whoever it may be) is not necessary either . One has to think beyond time and space to understand what I mean by my *Mahadwaitha* of East and West for world peace .

I saw a journal published by Spanda Foundation a Transnational Non-profit NGO for sustainable advancement of peace , knowledge and understanding and they had published a Music and Ritual Project edited by Keith Howard in 2006 which I happened to read in 2010 . This book should be seen by those people who asked me whether I am promoting Hinduism and Jesudas . They have said in the introduction itself that in all cultures of the world art and ritual , especially music and dance , occurred together and developed together. Ritual is a human activity from early stage of human development and in that music and dance were for creating atmosphere or to provide aural and visual markers that lend efficacy to the procedures and that is part of an ethnic people’s developmental history. In Indian people’s developmental history, then Indian music , dance, arts and languages and other scriptural stories has an important role and to ignore it saying these are just myths and religion, is not to know our own past and our own evolution as a people together. Which one developed first , music or ritual? The newborn child develop ability to explore sound and dance before it speak and walk and pray . So first is music and art . This ethnomusicological approach is what I am using in my studies.

Nepal in the Himalayas is a prehistoric part of India where part of Videha king Janaka and his daughter Sita , and the branch of Rama’s successors (Of Moolaka) as the Sakya Sudhodana and GouthamaSidhartha lived. The first article in this research work deals with the tribal old musical rituals and how the shaman heals with it .

The horoscope predictions, scriptural text readings and shamanic rites of sending dangerous spirits of ancestors away and applying music for pestilence and other disorders, the need for correct intonation and chanting are used by the tribals just like the Sanskrit *Thanthriks* of ancient India. Gurung is the word for Guru used by them. The shaman is a ritual expert and an astrologer, head or chieftain as well as a Gurung. To be a Shaman they start learning at 4 years of age and continues till 24 (20 years of study. Comparable to Indian traditions). The hills of Pokharan at 5000 feet height has a place called Yajnakot where the shaman interviewed by the research team had been living for generations as Shaman Gurus. At the beginning of the ritual they too chant the entire history of their Guruparampara (which has a 100) just like the Vedic practice. The shaman say that the Nepal Shaman has come from the four directions- South, east, west and North. This particular family has come from south (Cho or Ui Cho Hyula) and call themselves as Namtithu Namtahya Pachyu Tamu/Tamumai are considered as outsiders as Gurungs. Prominent in Annapurna hills and Manasalu mountains of Central Nepal speaking Tamu-Kyui language,. Pachyu is a pucu /Poju(Poojari) or shaman pajyu and the term is present in all mythical Tamu histories. The other Pajyu is from Karkola from the east, Pron from west, Chalden from South says Pignede (1993).

Pachyu Chiba means the head Shaman chosen by a possession. The learning has to be completed before marriage (during *Brahmacharya* as in Indian tradition). Four of the relatives play percussion instruments for the shaman and assist in his curing spells. The shamans are also *Vaidya* preparing herbal medicines. For the training of Pachyu phases of moon are important. Training starts from a time of partial eclipse. During full moon period spirits have less power so the student is taught to fight them during full moon. Healing is practiced as new moon rises, so that patient become better when moon becomes full. At daylight they collect herbs and at night they sing, dance play instruments and give herbal medicines. The dress, especially the cap and drum and cymbal of Pachyu resembles the Vealn/Vannan Veriyattu and the Khlypri that of Parya and Theyya Manthravada kolams (though the Nepali shaman is shown to wear shirts in photographs –may be a new addition to the attire-and the Vannan and Paraya does not wear it in their ritual times.). Fighting ancestral spirits is done by Pachyu only and they do not eat pork or buffalo just like Indians. Khlyeperi's job is to purify dead and send them to upperworld. Before they do it, the Pachyu has to send the dead spirit away by their ritual. The music and rhythms of these two groups differ.

The funeral rites rhythms of the Nepali ritual starts with rhythms of creation, not with destruction. Then invites ancestral spirits, goes to lower worlds, and call souls of dead, then bring soul back to meet the living. This is played with special drums which are rare (Padu and herga they call them) and submetric units change frequently as one pattern give way to next. The patterns are sad and mark separation and loss and there is gradual acceleration as sequence progresses. The interlocking patterns of the two drums represent split pulls of human life or struggle between good and bad deeds. (says Killius about it). The two drums speak between them a secret language in rhythms.

I remember the small hut of a Paraya just opposite our Nalapat House, across a small field. When at night a drum beats with a sad pathos note, my grandmother used to exclaim "Someone is dead. Appunni is calling the spirits". Nowadays that rhythm is not heard anywhere in Kerala, I think. That rhythm which reduce all the bad karma of the dead soul and make it pure and then send it to upper

worlds or heaven is lost . For brass cymbals (called *siljyo chhya*) or *Chyolle* , the shaman says they are fighting with spirits by speaking through cymbals and driving them away (bad ones). For a spirit (dead one) crying they use a Horn which Appunni also played in his ritual. Long hollowed and spiraled horns and conch shells are used for making two types of sounds –sad mourning , and happy auspicious ones. Cymbals are similar to Tibetan *rol-mo*. The instruments are bigger for *khyelpri* and high resonant frequencies come and go. The effect of a constantly changing harmonics is created.

The Nepali shamanic ritualistic music and its notations are given recorded from Cambridge research center in the book. And the British and western researchers are interested in how the eastern prehistoric music was used in healing , both by tribal and classical musicians of India. There is no religious interest in that type of research , but just a search or quest into the ways of an ethnic group of people and their past histories and cultural heritage and its development.

In Balinese history dance and drama is to pass down cultural values through tales of Ramayana, Mahabharatha, and other such epic stories. Bali dance is ritualistic and part of the popular religion of the land and propagated by court of royal kings. The relationship between what westerners usually call religion and what Balinese call *Agama* is a twisted tale . (page 74 Damp dreams some problems with dance in Bali by Mark Hobart . Keith Howard Ed Music and ritual). That is a sentence which catches our attention. *Agama* is an Indian word for Vedic culture . And that is not what the religion means in English language . This lack of understanding of modern human beings and scholars and westernized educationists has caused lot of confusion about spirituality and religion. .We have to rethink and redefine our understanding about India and its culture and its terms and rituals which are for healthy living in a geographic region.

Even the Vedic utterances against the enemies has to be understood as rituals to ward of harmful spirits as enemies in the early evolutionary history of human beings, and not as the political history of a servant class as enemies to the masters. It is an absurd idea to feel like that , and that idea came from the western masters who were facing struggles from the subdued colonial people as their servants and enemies and has nothing to do with Vedic rituals. The *Thripura* destroyed by God in the Veda is as much the final covering of mundane life as a triangle around the Bindu in the *Mahathripurasundari Chakra* of *Srividya* , rather than the political destruction of any city /urban center. Unless one know the different rituals associated with the vedic and tribal and thanthric people of the land and understand each as offshoots of the same primitive popular cults of the land , this fact will not be cognized. And when the wrath of *Parasurama* killed entire race of royalty, and when during end of *Dwaparayuga* destruction of all was predicted ,the people of the land had codified the important scriptures and protected them in popular as well as academic discipline (in Gurukula) for posterity and the message was given through *Katha* (which is a story drama,with dance and music ) to all alike as a means of survival of the knowledge among the remaining few (especially women and children who were the only survivors in both the situations mentioned).

In Balinese language Pulau Dewatha means The island of Divine ones. Pulau or Pulu(mayi ) and Pulava is then an islander for Balinese. Sumatra known a steh Gateway to Mecca of South East Asia the group music, dance and rhythmic percussions are famous. One type called Ratoh duek (sitting chattering) in Achean and Sman in Gayo is a secular folk game . The other is a Rateb duek (sitting devotional) partly religious. This was modified and used in Kerala Muslim traditions till the beginning of last century . I do remember groups of Rateb players (Mostly Muslim) coming to our courtyard to play this rhythmic dance in a circle with their percussion instruments. The origin is Mughal Indian says the book (page 88). The rateb is a sufi style trance and the music and dance rhythms are played throughout night just as the Paraya and Nepali shaman do . This is done during circumcision, weddings and for honouring guests too. In China the Xian Gyue with wind and percussion instrument is the oldest surviving music of the land , the living fossil (Huohuashi) as known by Chinese scholars. It was a popular music by folk musicians, labourers, peasants and lower social classes. The silk route had contributed to this musical culture to China and flute is an important constituent of the instrumental music. Confucius is attributed to have the four basic principles of ruling established as music, law, rituals and administration. Slow simple music along with rituals was a must in law and administration of China from Confucius times. Music had a ceremonial cultural value in administration of state since it was essential for stress relief and efficiency of rulers and citizens of the nation. The same principle we see in the administrative laws of India where royalty had ritualistic music , just like the common man , and both had to be healthy in mind and body and intellect for a healthy nation. The two tables below show how the Confucian administration was same as or similar to Indian system of music and astronomy, and Ayurvedic healing and use of it in the five elements and the state administration.

Table 1:-

12 pitches . Huang zhong, dalu, taicou, jiazhong, guxian, zhonglu, ruibin, linzhong, yize, nanlu, wuyi, yingzhong.

Each of these alternate as yang, yin, yang , yin

The five degrees : 1<sup>st</sup> pitch is gong. 3<sup>rd</sup> is shang, 5<sup>th</sup> is jue, 8<sup>th</sup> zhi, 10<sup>th</sup> yu

Order of state: Gong is emperor, shang minister, guxian people, zhi matter, yu affairs

Internal organs: spleen, lung , liver, heart, kidney in that order (for the 5 degrees)

Human character:-trust, loyalty, humanity, courtesy, wisdom (for the five degree)

Element : Earth, metal, wood, fire, and water

Directions: Middle, west, east, south and North

Colour:-yellow, white, green, red, black

Table 2:-

Source of sound.. instrument    moral implication

Metal	Bells	order, horizontal, power, military commander
Stone	chimes	discernment, death, result of defending frontiers
Silk	Qin, Se	sadness, honourable, will power, courageous officer
Bamboo	flute	spreading out, gathering crowd, resource gathering officer
Gourd	mouth organ	
Earth	globular flute	
Skin	drums	power, movement, a moving crowd, generals and officers
Wood	zhu, Yu	

This ritual and meaning came to existence in 3<sup>rd</sup> century BC in China.

When I compare this with the extensive Thantric scriptural material and Yoga literature of India and also the Ayurvedic and Musicological ancient texts , along with my childhood experiences of popular and folk music of villages where all the tribal and folk arts existed harmoniously , we had a rich tradition compared to the other parts of the world and how much research can be done in Indian music and culture , if the foolish so-called Intelligentia and academicians of universities throw away their preformed notion that whatever is written in Sanskrit is religious and is whatever is ritualistic in India is Hinduism and it is equivalent to the term religion as used with the semitic meaning. Hinduism is a culture, a living tradition of ethnic geographical civilization of a people who lived in the subcontinent from Himalaya to Kanyakumari .The varied cultural peculiarities of each region and the codified and educational schemes organized by ancestors to protect each needs more care and research , rather than dumping it in the dustbin of religion and politics and terms like Right wing and left wing.

I am totally unaware of the right or left wings since I always take the Royal Middle path to truth , what is called the *Rajamarga* , as in *Tyagarajas's Kharaharapriya* composition "*Chakkani Rajamargamu*".

I have only one request to researchers who are true truth seekers. Dont be fooled by preformed opinions. Observe everything, question, analyse and if found to be logically and experimentally as well as experience-wise true , accept it as truth. That is science. To label something as myth, untruth, religion etc and refusing to study and analyse it makes that something lost to posterity forever. The ethnoarcheology, ethnomusicology and ethnic history of India is a living tradition still and study these well before coming to a conclusion. There might have been superstitions in it as in the shamanistic beliefs of ancient past , but those were the first thought processes of a people before they became evolved and in every step of evolution, in their changing scriptures we find evidences of the evolving thought processes and studying that we will be able to compare our own knowledge systems with the



knowledge systems of ancient and from that comparative wisdom we would be able to make a better, classless and free society equal in every respect –economically, educationally ,but diverse in their cultural ritualistic music and arts traditions and belief systems.

I had finished writing this short piece yesterday night, before I went to sleep. Today morning (on 7<sup>th</sup> June 2010) Times of India reports that a psychologist Matt Rosano , Professor and Head of Department of Psychology in his book “Supernatural selection :How religion evolved” has stressed the role of religion in the struggles of prehistory for survival and reproductive advantage. He says that roots of religion stretch as far back as half a million years, when our ancestors developed the motor control to engage in social rituals-that is to sing and dance together. 70000 years ago, a global ecological crisis drove humanity to edge of extinction, and forced survivors to create a new strategy for survival, and religious rituals were foremost among them. This book is said to be a response to the 2006 bestseller “The God Delusion”by Richard Dawkins, an atheist manifesto that pitted science against religion.

Rossano says Dawkins missed the science that revealed how religion made man more human. He pulls together evidence from a wide range of disciplines to show the valuable purpose served by systematic belief in the supernatural power. According to him, evidence confirms that at its core religion was not about doctrines, creeds, institutions or miracles, but about relationships. Religion is a fundamental way for humans to relate to each other and the world around them and in early prehistory that was a definite advantage.

I have not read both the books. But it seems to me what data and evidences I have been collecting throughout my life (from my own personal and professional life experiences, from other people’s experiences and sciences and scriptures of east and west and comparisons thereof) has something in common with Rossano’s work. May be we are two *samaanahridaya* (likeminded individuals) who have done the same methods of observations and research , at two points in space , simultaneously , or a synchronicity in psychological and astronomical terms.

Ref: 1.Music and Ritual Project Ed;Keith Howard in 2006

2.Damp dreams: Some problems with dance in Bali .Mark Hobar(,Keith Howard Ed: )Music and Ritual

Chapter 25 : Principle of sound in Music:

Study of sound with physics of its traveling medium air and variations of air pressure  $p(x,y,z,t)$  according to position in space  $x,y,z$  and to time  $t$  started with knowledge of

*Dik, desa, kaala* and *gathi* and its *phala* (direction, space, time, movement, and its effects) in ancient India. The variations of the air pressure perceived through ears gave rise to a *sabdasaasthra* (science of sound) and to language and music. The propagation of sound in air is in waves or *tharanga* just as in water and this was observed by Indians who watch both ocean currents, monsoon winds, sound of first thunder reverberating in the season with a clockwork precision in Tropical India. The concept of filtering of sound which allows certain frequencies to be singled out developed by them lead to techniques of musical instruments.

Dik/direction: Soundwave propagate in all directions/in any directions. The obstacles in its path determines its directions that we hear it. This is especially noticed when a person is on a hilltop or sea and the people of South India have been experts in this due to their seafaring and hillforest dwelling nature.

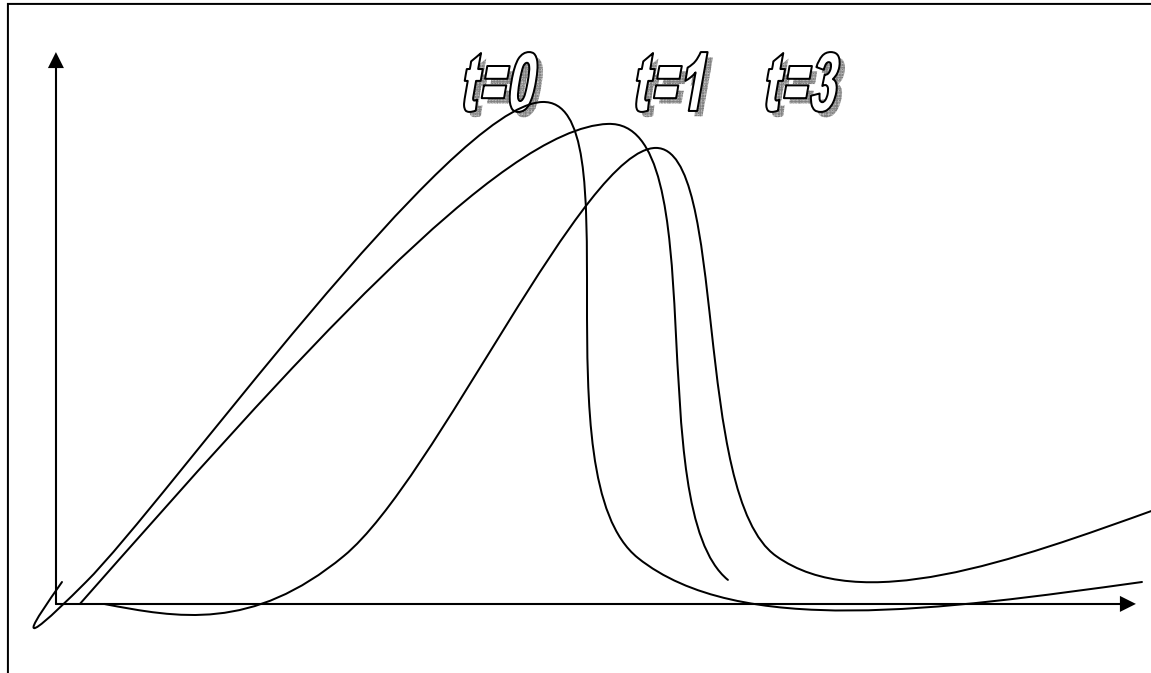
Suppose a wave depend on only one direction in space, we call it a plane wave. Suppose this direction is the X axis. Then the airpressure  $p(x,y,z,t)$  is independent of  $y$  and  $z$ . Hence denoted as  $p(xy)$ . This function represents a planewave propagating through space, and a wave inside any tube, canal, cave etc. This wave equation was known to Europe only after Euler and is now called the Euler equation. This equation determines the movement of sound waves in the vibrating parts (strings of string instruments, membranes of percussion instruments, in tubes of instruments like flutes etc). So without knowing this equation an ancient person cannot construct such instruments and the existence of these in ancient India proves the knowledge of *sabdasasthra* and astrophysics of sound waves in spacetime and thus is the best proof for what is said in ancient Indian literature (*Veda, Upanishad* and the other scriptures) with supportive evidence from Archeology of IVC /Harappan sites.

In the case of air, this equation is inferred from 3 fundamental equations of continuum mechanics.

Along with air pressure  $p(x,t)$  we depend on 2 other variables of air:

1. its density  $d(x,t)$  and average speed  $v(x,t)$  of air molecules set in motion by a sound wave. This is not the individual speed of each molecule due to thermal agitation, the magnitude of which is close to that of speed of sound, designated as  $c$ . The planewave move in direction parallel to Ox axis and both the speed  $v$  and pressure are independent of  $y$  and  $z$ . In absence of atmospheric perturbation,  $v$  varies around average value  $0$  and  $p$  and  $d$  vary around average value  $p_0$  and  $d_0$ .

Fig 1: traveling planewave along an axis.



In a cylinder , which has a fixed section of space with axis parallel to  $Ox$  axis and 2 surfaces  $S_a$  and  $S_b$  , with respective  $x$  coordinates  $a$  and  $b$  , and areas  $S$  the variation of air mass  $m(t)$  is due to amount of air going through 2 surfaces. Nothing goes through the other interfaces since the speed is parallel to  $Ox$  axis. The linear acoustics hypothesis assumes the variations with respect to equilibrium state which are small (parameter  $\epsilon$ ). If we neglect this  $\epsilon^2$  , we get conservation of mass equation , called a continuity equation (*Nairantharya* ) which  $=0$ .

Section of air that moves in a flute , with two surfaces  $S_a(t)$  and  $S_b(t)$  when we apply an external force (the breath of the flutist) through surface  $s_a(t)$  is then equal to  $S_p(at)$ .

Here the flutist is applying the Newton's second law of motion  $F=d(mv)/dt$  . By controlling the pressure and speed of the movement by his fingers the flutist (and the first human being who used a flute ) had been experimenting and proving the theories of astronomy and astrophysics. When we assume the variations with respect to equilibrium states as small , and neglect the small  $\epsilon^2$  we get the Euler equation. This is done by Indian astronomers when they leave out the *ayanamsa* .

Suppose there are no heat transfers from one air section to another, or with outside, (the compression and expansion are adiabatic –hypothesis confirmed if these effects are fast enough) the state equation expresses that air pressure variations are proportional to variations in density. And the equation also means that air has elastic property. It acts like a spring . A constant  $c$  has appeared and this represents the speed of sound. Air pressure and study of  $c$  as speed of sound was done by a series of measurements only in 16<sup>th</sup> century by a European doctor (medical) who came to India . Why was it not known to European scientists before 16<sup>th</sup> century and known to Indians (especially south Indians) millennia before is to be thought of . The continuity equation and state equation to be zero , the south Indians depended upon the lunar and solar clocks which bring the first monsoon and the first thunder and the zero point was always Lanka (the first landmass in the subcontinent where the vibrations of the sound are felt ) . Any ancient astronomy text can be verified for this.

intensity of sound originating from a punctual source (in the absence of damping) is inversely proportional to the square of the distance from that source.

Hearing threshold approximately  $i_0=10^{-12} \text{ W/m}^2$ .

The normal level of conversation is  $1.2 \times 10^{-5} \text{ W /m}^2$

Pain threshold  $1 \text{ W/m}^2$ .

Therefore the impressive range of the human ear is  $10^{12}$ .

This is what the *Rishi* of India calculated with his *Aananda*/bliss as *parardha* .(ref Raagachikitsa Dr Suvarna Nalapat 2008).

Bel or decibel is a better unit than Watts, a dimensionless unit that measures the 10<sup>th</sup> of the base 10 logarithm of a ratio to a given threshold , the hearing threshold for example. If sound intensity is  $L_1$  it is expressed as  $10 \log I/I_0 \text{ dB}$

As a consequence the hearing threshold is set at 0 dB , pain threshold at 120 dB and for conversation it is equivalent to 70 dB . In some rock concerts the intensity exceeds 140 dB according to studies.

Suppose the number of violins (instruments) are multiplied as in a symphonic orchestra what happens? A 10dB decrease in sound level. Going from 1 to 10 violins leads the same volume increase as when going from 10 to 100 violins. This , now called Fechner's law means a sensation varies proportionately to logarithm of the stimulus. This is what is explained in detail both in Indian music, astronomy and veda in language of acoustics, astrophysics and philosophy .

The pitch

Music note has 3 main parameters : pitch, duration , intensity. Pitch is related to frequency . Low frequency correspond to low frequency sounds. High frequency correspond to high frequency sounds. The reference frequency for a musician is the A at 440 Hz , the note made by a tuning fork , and a note used for most dial tones.

Intervals and octave:- Distance between 2 notes is the interval (*Antharam*/Sanskrit) or *antharakkol* of the Tamil. When a human ear estimate the interval between 2 notes, what affects their perception is the ratio of their frequencies and not the difference in frequencies. This is another example of Fechner's law. Our sensation or experience of pitch vary proportionately to the logarithm of the frequency. This will not apply to extremely lowpitched and extremely highpitched sounds.

Two musical intervals 110-220 Hz ; and 220-440 Hz are perceived as equal since both have a ratio of 2 . $220/110=2$  ;  $440/220=2$

But in a mathematical sense the second interval is twice as long as the first.

$440-220=2(220-110)$ . The interval between 2 notes where the frequency ratio is equal to zero is called an octave.

Sounds produced by 2 notes one octave apart from each other are very similar. They are sometimes referred to as the same note. Frequency 880 Hz , one octave above A of a tuning fork produce an A but at a higher pitch. To tell them apart one has to use a scientific pitch notation , naming each separately .

For example the 440 Hz as A4, next one 880 Hz as A5 , followed by A6 at 1760 Hz. On the other direction, A 3 as 220Hz, A2 as 110 Hz, and so on. The same goes to other notes found between the C at 261.6Hz and B at 493.9 Hz. All these are located in the middle or *Madhya* of the keyboard (and on cosmos as *Madhyamagathi* ).

These principles are discussed by *Yajnavalkya* in BU to his wife Maithreyi and commented upon by Sankara beautifully and I have detailed these in my commentary of the 12 Upanishads , Sudhasindhu . Also in my books on *Ragachikitsa* (D C Books and Readworthy Publications). The tuning fork, the bell (seen under water from *Dwaraka* excavations) and the singing bowls also bear testimony to the experiments conducted by ancient civilizations on these principles.

Division of octave:-

Other intervals are determined by the choice of a tuning system , which sets the frequency ratios of notes to one another .The equal temperament , the system is divided into 12 equal intervals called semitones with frequency ratio  $2^{1/12} \approx 1.0595$ . If we start at a note with frequency  $f$  and go up a semitone 12 times, we get , one after the other , the notes with frequencies  $2^{1/12} f$ ;

$$2^{1/12} \times 2^{1/12} f = 2^{2/12} f,$$

$2^{3/12}f \dots 2^{11/12}f \dots 2^{12/12}f = 2f$  bringing us to the octave above by equal intervals. This is used by Indus valley mathematicians and *Brihadhesi* of sage *Mathnaga* and *Bharatha's Natyasastra* knew this (scriptural) . Indian astronomy texts also give ample evidence for the knowledge of Indians about these.

The 13 notes comprise of the chromatic scale. (Chinese knew it 4000 years ago). Egyptians knew it from the evidence of the tuning fork in one of its pyramids. And Indians knew it right from IVC/Harappan times and before. So we know that European astronomy, mathematics, and musical notes have come from other ancient civilizations. The combined interval of 2 semitones is called a tone and there are 6 tones in an octave .(Just as the 24 hours of a day make 12 rasi and 12 rasi make 6 seasons with raaga for each of these in Indian music corresponding to the day, seasons, year round forever in repeating cycles or wheels of time). The corresponding whole tone scales used by Claude Debussy was an ancient practice of all our human ancestors.

Diatonic scales:- The usual scales are not the chromatic or whole tone scales but are diatonic scales based on both types of intervals.

The tone, the semitone, and comprising 8 notes, (sa,ri,ga,ma,pa,dha.ni.sa) the last sa is one octave high (2) than the first sa (1) .These results are the result of placing two *chathusruthi* (tetrachords) one after the other , where each *chathusruthi* must include 2 tones, hence the name diatonic. The different possible modes or scales and the notes of each scale are thus defined. The notes are the degrees of the scale. The first and 8<sup>th</sup> (being the same note /*Shadja*) is the tonic, the 5<sup>th</sup> is the dominant and 7<sup>th</sup> is the leading tone , the degree that leads to the tonic in tonal harmony.

2 types of diatonic scales are major and minor. The third and the 6<sup>th</sup> degrees differ (the tonal notes) in them. Bright , upbeat, marching and festive and dance themes in major , mourning, sad and pathos in minor scale. The other scales are modal scales widely used during middle ages in church music.

Diatonic major scale:- Starting with C , tone, tone, semitone, tone, tone, tone, semitone alternating we have C,D,EF,G,A,B.

Staff :-

This notation was first given to Europe only in early 11<sup>th</sup> century by Guy d'Arezzo.

That shows the antiquity of Indian musical scales to that of Europe . At that time , Europe had not had the knowledge of astronomy or the contact with Asia except through the Arabs . Intervals D-A, E-B, and F-C form a fifth , comprised of 3 and  $\frac{1}{2}$  tones and corresponding to frequency ratio  $2^{7/12} \approx 1.5$  ( see the measurements of Indus valley people ).

Minor scales:- 2 types of minor diatonic scales depending upon *arohana* (ascend) or descend (*avarohana*) of a melody (*Raga*).

Ascending scale =C,D,Eb,F,G,A,B,C

Descending =C,D,Eb,F,G,Ab,Bb,C.

Also A,B,C,D,E,F,G,A without any alteration.(a relative minor scale of C major).

Harmonic minor scale:- Different minor scale used to compose the chords (the harmony) meant as accompaniment of a melody composed in a minor scale. Its sequence is C,D,Eb,F,G,Ab,B,C.

.

The listener located in a point in space perceive variation in pressure in that point. This variation is a function in time and is denoted by  $s(t)=p_a(x,t)$ . It is the sound signal. (In case of tropical India the sound signal is the thunder sound in cosmic scale ). Depending on the context the sinusoidal signals are expressed . In case of real functions, frequency is always assumed to be +ve or equal to zero . For complex functions , because  $\cos(2 \pi ft)=\exp(2 \pi ift)+\exp(-2 \pi ift)$  divided by 2 , we have to consider negative frequencies also .

The sinusoidal sound is the simplest of the possible sound and is the pure sound. For a plane wave it is the sound produced at all points  $x$  . The wave equation is linear and homogenous. At a given fixed point  $x$ , the perceived sound is complex and is the result of superimposing 2 frequencies  $f_1$  and  $f_2$ . Taking this process further shows an acoustic wave at certain point in space produce a sound signal . If the sum is an infinite number of terms it can be evaluated only if  $a_n$  and  $f_n$  in the sum meet certain convergence conditions. The spectrum of such a sound , that is to say set frequencies  $f_n$  contained in the sum is said to be a discrete spectrum. A young healthy person perceive frequencies from 20 Hz to 20 kHz and beyond these , sounds are inaudible infrasound and ultrasounds.

If all frequencies are integer multiples of a given frequency  $f > 0$  :  $f_n = nf$ , the sound signal is periodic .Are there any truly periodic sounds ? Yes . In the sound of a trumpet we hear it .(*Murasu/Perumpara* in India). The *panchari /panchavadya* in membranophones . This measure is perfectly represented in IVC/Harappan as I have already discussed. The true periodicity is proven in the repeating cyclical rhythms of seasons, circadian rhythms, unisolar and seasonal rhythms etc. If there had been no sounds before the big bang , no truly periodic sounds are possible. The big bang or creation itself has to be thus a periodic one (as *yuga, mahayuga, kalpa*) according to the law of periodicity of sound .

In the first harmonic which is fundamental , if  $f$  is frequency of C4 (261.6Hz) then  $f_2$  is one octave above (C5),  $f_3$  is  $1/5^{\text{th}}$  higher (G5)  $f_5$  is slightly below major  $3^{\text{rd}}$  E6 etc.

261.6 Hz =f	C4
2f	C5
3f	G5
4f	C6
5f	E6
6f	G6
7f	Bb6
8f	C7
9f	D7

A sound composed of a high number of harmonics is perceived as rich whereas sound comprised of only a few harmonics is considered poor or deficient.

How one makes a *gamaka /kampana*:-

The signal obtained by adding all the terms  $(\sin 2\pi nt)/n$  ;  $n=1,2,3,4$ . Then we are getting closer to the Triangular signal , the simplest model of a sound on a string instrument .

The Clarinets (right from the *Makuti* of the snakecharmer, to the flutes of the ancient man) has fundamental and successive additions of 3<sup>rd</sup>, 5<sup>th</sup> and 7<sup>th</sup> harmonics and the law for the sustained sound string instruments (like violin/*yazh*/lute /harp etc) periodic sounds over a period of time , was described using a mathematical tool analysis by Indus valley people as we see from their mathematical knowledge. In Europe the first to analyse the periodic sounds was mathematician Joseph Fourier (1768-1830) and he was the first to decompose them to trigonometric series. But *Thrikonamithi* or Trigonometry was known to Indians as early as IVC and before that , as we see from the relics left by them .

Was Fourier's discovery a result of the contact with Asian knowledge system remains to be discussed.

Bells, other percussion instruments , produce sounds which are not periodic and are of the Harmonic C minor scale type. Piano also to some extent do produce this. All frequencies  $f_n$  are integer multiples of  $f$ . Therefore there is no frequency and the Fourier mechanics cannot be directly applied. The frequencies in such a sound is a partial. Example the temple bell has frequencies of 0.5, 1, 1.2, 1.5, 2, 2.5, and 3  $f$ . The second partial is called the principal that determine the pitch of the note. The first 5 partials of a bell's



sound can be changed by changing its thickness, and arrange them so that the 3<sup>rd</sup> partial is a minor third (ratio of  $2^{3/12} \approx 1.189$  in equal temperament) above the principal, which gives them a characteristic sound. Analysis of a large bell yield the following frequencies (for  $f_p=233$  Hz Bb3) and respective intensities.

Frequency $f = (x) \times f_p$	Intensities (I)
0.5	350
1.	950
1.188	500
1.530	150
2	700
2.470	100
.2.607	250
2.650	370
2.991	1000
3.367	180
4.137	300
4.487	100
4.829	150
5.385	300
5.863	100
6.709	100
8.077	50
8.547	20
9.017	10
9.530	35
11.026	5

12.393	15

The better sound reconstruction was done by our ancient architects/metal workers by combination of metals (which requires knowledge of advanced metallurgy and chemistry )To speak strictly even these have periodicity. (period  $10/f_p$ ) since the 7 frequencies are integer multiples of  $f_p/10$ . But the first 4 harmonics are equal to zero , and if partials are added the value of  $f_p/10$  will no longer be suitable.

#### VOCAL SINGING:-

Singing is close to periodic sound , but with more complex sounds such as a spoken voice .With spoken voice we are further off from periodic sounds, and are not dealing with sums of punctual frequencies anymore . It is the opposite . A continuous set of frequencies. Instead of being written as a sum of  $\exp(2i\pi f_n t)$  terms with frequency  $f_n$  , such sounds  $s(t)$  can be represented using integrals of similar terms .Fourrier transformation is then used. The spectrum of such a sound is a continuous spectrum .What does Fourier transformation has to do with Fourier series?

The musicians while they transcribe a musical piece to a score use both time and frequency. Suppose we analyse a single singer's one musical piece , we may be able to say how such a representation is achieved by that musician, where the high intensities are displayed in darker tones, and weak intensities with lighter tones . What famous vibration earned that singer so many admirers, and how remarkably regular is that performance capability in a series of stage performances (by a retrospective as well as prospective study).

But nature lovers know that birds also sing beautifully. The koil, the goldfinch, the mountain whistlers and blackbirds etc .. to mention a few. And biologically the bird sound and best male voice is always linked to testosterone as I have already discussed. At present we are surrounded by noise and we need a reappraisal of what is to live in a environment of sound of music for better brain performance and for overall health .

In phonetics sound fall into two categories. Those that involve vocal chords are the vowels and sonorant consonants such as a,e,u,l,o, m . And those in which vocal chord takes no part or do not vibrate called the obstruent consonants like sh,s etc.

(Sanskrit call them *Naada(sound)* and *swaasa(breath)* and the *Mahaapraana* Ha which is both *naadi* and *swaasi*).Vocal chords produce a more or less periodic sound , unlike the sounds which are whistled or hissed.

Vowels are responsible for peaks found at multiples of 110 Hz. Using a rectangular window and timefrequency analysis by spectrogram , the *la* and *A* of *Sha* were musical and the *sh* was noisy . The swaras are musical and the consonants are noisy unless accompanied by the swara . This is the development style of Indian languages with several *swara* .In this , the swara e,a,and o for harmonics produced music in vocal chords The lack of image sharpness occur due to:

1.qualitative

2.quantitative as Heisenberg's uncertainty principle in quantum mechanics , it is impossible to measure with an arbitrary precision both the position and the speed of a particle.

The analysis of five vowels (which the *Thanthriks* use for sound healing) were spectrographically analysed. These sounds were fairly concentrated in the lower frequencies. Each vowel produced a darker area , hence more intense, corresponding to resonance frequency of the vocal tract. These frequencies depend on form or shape of the latter and hence they are called formants. In the first few (6) seconds the upper harmonics do not follow the melodic line of the first 2 but hover in place.This is due to highpitched harmonics having the same number (at the beginning 1,2,6,7,8,9) are not the ones that are intense in each of these notes , instead it is those found at 2500 to 4000 Hz range. The sound is shaped by the vocal tract , which reinforces certain frequencies and attenuates others and hence the name . (O formed a very beautiful circle and aei forms a *naama* with a line below in figure (page 48 .Phillippe Guillaume).The importance of Om and Aei or Ei in *Thanthric Srividya Upasana* of *Nada* is thus proved.

Filtering a sound:- Is like you turn a bass and treble dials on your stereo , to modify the sound's lowpitched to high pitched ratio.

A pure sound with only one harmonics with frequency  $f$  . Two operations can be performed on this sound.

1 Amplification by a factor  $a > 0$ .

2.Phase shifting by an angle . The phase shifting is also a delay . When we do both these operations we get a sound with multiplication of the initial sound by a complex number .Combining these 2 operations are at the core of filtering :amplification and or phase shifting. Filtering is linear , and unaffected by time shifting . In other words, filtering then shifting by the time interval  $t_0$  yields the same result as a shift by the same time interval followed by the filtering.

When the function can be defined for any frequency  $f$  , it is called the filter's transfer function.

What is the point of filtering ? To analyse a sound signal or to modify its frequency component. If a sound is too bright, filter it through a low filter , even equal to zero for the high frequencies .(Lowpass filter). To select intermediate frequencies and to attenuate all others a bandpass filter is used.

A roughly triangular signal comprise of the first four harmonics alone and with fundamental 1 Hz. Filter with 3 filters with lowpass, bandpass and highpass. The first 2 single out the frequencies 1 Hz and 2 Hz respectively . The 3<sup>rd</sup> filter isolate the sum of the 2 components with frequencies 3 and 4 Hz. This is applied to rectangular signals also.

Filter impulse response of the Fourier transformation function  $h(t)$  is the filters output signal when the input is the Dirac impulse in 0 . This impulse denoted by  $\delta(t)$  is an infinitely brief signal (but is not an actual function) with all its energy focused in zero , and such that for any continuous function  $\phi$ , that is to say, a function without any gap.

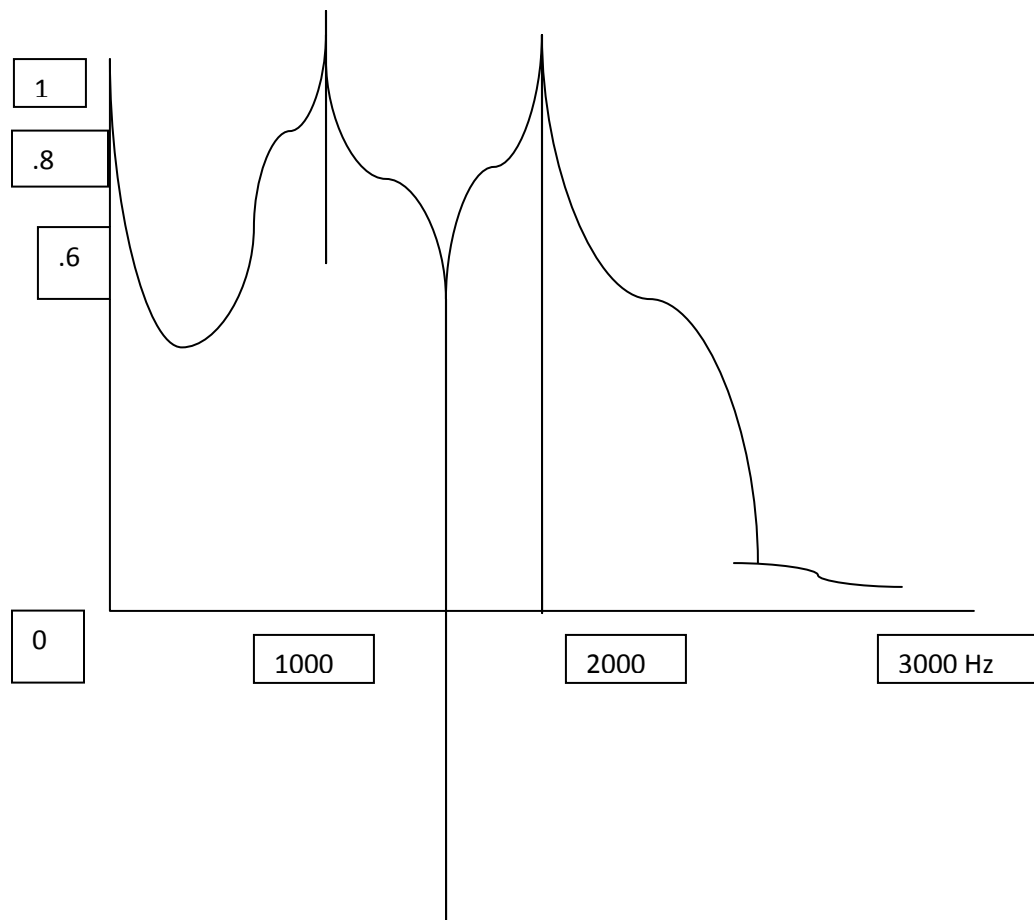
The function  $v$  resulting from filtering is expressed as convolution product of  $h$  and  $s$ . This product obeys the important property , called commutativity :  $h*s=s*h$

Permutations and commutations of the various *swara* and pitch (*sruthi* )in *Melakartha* is demonstrating these mathematical property of sound and is important for any student of music as well as astrophysics and mathematics and to a person concerned with balancing biomedical health.

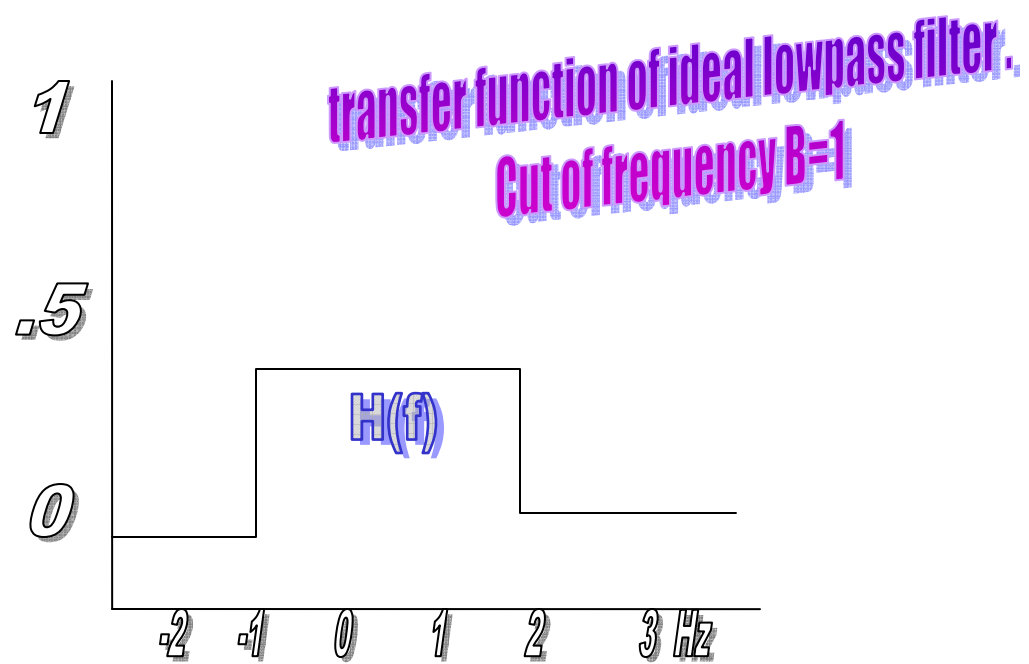
Filtering of sound with continuous spectrum :-

It means sound with  $\hat{s}$  as the Fourier transformation of  $s$ . Filtering a sound signal  $s(t)$  using a filter with transfer function  $H(f)$  will yield the signal  $v(t)$ , the Fourier transform of which will be  $H(f)\hat{s}(f)$ :  $\hat{v}(f)=H(f)\hat{s}(f)$ . Thus value of transfer function  $H(f)$  can be seen as amplification factor /phase shift of signal  $s(t)$  at frequency  $f$ . The function  $H(f)$  is Fourier transform of a function  $h(t)$  still called a impulse response and have a convolution product  $v=h*s$ ,

The underlying mathematical theory was developed in 19<sup>th</sup> to 20<sup>th</sup> century alone in Europe by Laurent Schwartz (1915-2002) who invented distributions , a generalization of the concept of functions. The application is that a sound received by a listener , in a concert hall, can be seen as the result of sound coming from the orchestra , filtered by the filter made by the room itself. A rough idea of impulse response can be gathered by clapping one's hands by emitting a very brief sound. What is the perception of a listener , if the concert hall transfer function is as shown below:



The ideal lowpass filter (below) with cut off frequency  $B$  is given by its transfer function :  $H(f)=1$  if  $f \leq B$  and 0 otherwise. Hence the filter passes frequencies  $f \leq B$  without affecting them and blocks frequencies  $f > B$  .



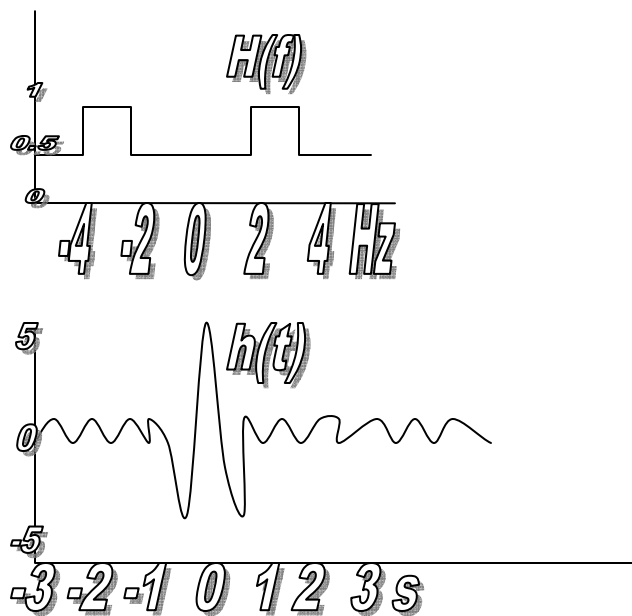
$h(t)$

-3 -2 -1 0 1 2 3 s

This is called ideal because this cannot be achieved physically . It can merely be approximated as precisely as desired by a mental process (now done on an electronics system which has taken away the human mental approximation component of human consciousness from it). This approximation is possible only by allowing a certain delay for the output. The value of  $H$  at both ends  $B$  and  $-b$  (the *savya and apasavya*) has no importance in theory , since the integral does not see isolated punctual values except if there are Dirac masses at those points . (This is the story of astrophysics, classical music and philosophy of *dwitha* vs *advaita* in India and that is what *sabdasasthra* and musicology of India had been demonstrating but with creation of *aananda* , quite unlike other sciences which are unapproachable to masses.

Impulse response  $h$  can be obtained by a sine cardinal function (cardinal because it is equal to zero for all integers and is given by  $\text{sinc}(t) = \sin(\pi t) / \pi t$ ).

Transfer function and impulse response of ideal bandpass filter with cut off frequency 1 and 3 is shown below.



This is a carrier wave in radio communication with its amplitude modulated by impulse response of the ideal low pass filter and is a frequency  $\cos(2\pi f_0 t)$ .

Finally the all-pass filter possess everything .The modulus of its transference function is 1. A pure sound is transformed by this filter so that its phase shift is seen by an angle  $\Theta(f)$  ,dependent on the frequency , but with no amplitude modification.This filter simulate the reverberations .

Normal reflection of a soundwave on a wall, comb filtering by a microphone located near a wall, the summing of intensities by a listener who is located far enough from the orchestra can be considered .

Each of the instruments produce a traveling plane pressure wave , on their own level and using Euler equation one can know the corresponding air speed, the position of listener at a fixed point  $x$  . Each instrument and singer play the same note , with a fundamental frequency  $f$ , with the same strength so that the possible phase shifts /differences between the sounds at a fixed point  $x$  , where the function  $s$  is  $T$ -periodic with  $T=1/f$  . For this one has to first calculate the sound intensity of a single instrument or a single singer over a period  $T$  . To get an intensity increase of 10dB or 20 dB from the single instrument/singer voice the amplitude is to be multiplied by a factor  $\sqrt{10} \approx 3.16$ ;by 10. When all the instruments play , at  $x$  the total acoustic pressure and associated speed , as total intensity  $I_{10}$  at point  $x$  ,



with Cauchy-Schwartz inequality , is such that the associated decibel levels are  $LI_{10} < -LI_1 + 20$  decibel .This is so , even if 10 instruments (10 violins)are playing.

For a standing pressure wave , using Euler equation to find speed  $v$  , intensity over a period  $T=l/f$  is  $=0$ . Interpretation is, a standing wave carries no energy (it only fluctuates without traveling). The siren was invented by French engineer Cagniard de la Tour (1777-1859) and its sound and function of instantaneous frequency as sinusoidal variation studied by Europeans. Siren of a ship is a noise and not a musical one . And noise and siren interlude and its echoes studied .

A sound with three consecutive notes each of which comprise 4 harmonics (*chathusruthi*) :  $a = 1000, 100, 10, 1$  ;  $f = 440, 880, 1320, 1760$  ;  $p = 0, 0, 0, 0$  ;  $T = 1$ .  $Fe = 11025$ ;  $s1 = \text{synthad}(a, f, p, T, Fe)$ ;  $s2 = \text{synthad}(a, 1.5 * f, p, T, Fe)$ ;  $s3 = \text{synthad}(a, 2 * f, p, T, Fe)$ ;  $s = (s1, s2, s3)$

Sound  $sc(s, Fe)$  .  $sc$  means a scale.  $s$  is a vector  $s$  resulting from the three vectors  $s1, s2, s3$  one after the other. The  $soundsc$  function or the scale function automatically multiplies and shifts the sound samples so as to have a minimum equal to -1 and maximum equal to 1. Its drawback is that it will not give a sound starting or ending near 0 (It has neither birth nor death). This inconvenience of not having an end and beginning for creation is difficult for human brain to comprehend and hence avoided by writing it as  $s = s / \max(\text{abs}(s))$ ;  $\text{sound}(s, Fe)$

Therefore absence or *abhava* of sound and beginning and end of sound is only a method for human brain to understand the oneness of entire creation . The *dwaitha* is only a method for cognition or educating human brain .

Frequency analysis of a sound  $s(t)$  with duration  $T$  , on frequency range  $F(\max)$  :

$S$  is chosen as a periodic sound with harmonics 440 Hz , 880 Hz, 1320 Hz , and three peaks appear for the  $x$  coordinates 440, 880, 1320 Hz with heights proportionate to the weights ( $\alpha_n$ ) of each of these harmonics. (This is given in the Book Music and Acoustics , From instruments to computer by Philippe Guillaume page 62 First South Asian edition 2007 from ISTE Ltd Lavoisier.)

A comparison of Indian system:--The multiples of 11 is used here just as we use 22 sruthi and in Indian astronomy 110, 220, 330, 440, 550, 660, 770, 880, 990, ..... 1320 (which is  $120 \times 11$  taken in *dasamsa* as 13.20 as a cosmic *nakshathramaana* or spacetime of a fixed star compared to 8.8 of a sunray near to our earth with a 110 or 11. 0 basic , and with 22 sruthi from light of sun ) and it also takes into account the power of attraction based on distance and gravitational (attraction pull) and intensity of it because of weight etc. In fact the figures used by Newton as 110 which is given in Indian systems was pointed out

as a mistake of Newton by a research student Philips Garisto, a few years back and I had clarified the point that he was using an old Indian tradition, the source of which either he didn't know or he did not want to disclose because of some restraints of which we do not know.

Ref: Music and Acoustics , From instruments to computer by Philippe Guillaume First South Asian edition 2007 from ISTE Ltd Lavoisier.)

#### Chapter 26.The cassette culture and Yesudas music

Popular music in India is conditioned by technological and mediarelated developments. The cassette industry brought Indian music industry both negative and positive effects of the phenomenon of focus on decentralization and democratization and since my thesis is on Jesudas, I have to discuss this process in detail ,because it was as his brainchild in South India the first launched Tharangini studio started in Trivandrum to democratize and decentralize cassette industry in South India, if not in entire India. The acoustics and painting always go together, as shown by the direction of paintings in ancient caves. The musician who knows acoustics is like a partial scientist and partial artist , both his right and left brains are functioning simultaneously . In India , the only musician so far who can be said to be a good musician/singer as well as an acoustic engineer and a painter is possibly Jesudas , a rare combination to have.

Filmy, nonfilmy, folk, light and classical/semiclassical, devotional music became popularized through this venture..The unchallenged dominance of HMT , T series etc in North India was slowly giving way to the new phase by the south Indian studio . In early 1980s television and in 1996 cable/satellite TV networks came reaching out to 10 million homes and in 1996 it boosted the sale of western music to 5 % but 95 % music purchased is still local. Illustrating the ongoing internal dynamism and resilience of Indian popular music industry. Jesudas an icon of Indian popular music is part and parcel of the cassette culture and this chapter on cassette culture is representative of that icon.

The Holistic study of cassette phenomena include ethnomusicology, economics, media studies, empirical description of cassette industry and musical developments, analytical perspectives of communication theory. The case study of Tharangini studio represents a grassroot-based decentralized , pleuralistic, democratic-participant micromedium in a given region , whose negative and positive ramifications may

have broader implications for the spread of such technologies elsewhere.(cassette culture .Popular music and technology in North India .Peter Manudl .Oxford uty press 2001 pp 4)

Repressive use of media	Emanicipatory use of media
1Centrally controlled programme ,one transmitter,several receivers	1Decentralised programme each receiver ,a potential transmitter
2.passive consumer behaviour	2.Interaction of those involved ,feedback
3production by specialists	3.collective production
4control by property owners or beaureaucracy	4social control by selforganisation

Emanicipatory use is ideal with the modest goal of local identity reassertation, spread of interactive grassroot media, ideally revitalizing the community values , enhancing local sociopolitical participation, and offering greater diversity and richness of media content .It addresses the needs of smallscale communities, interest groups and taste cultures and it is in this emanicipatory use , jesudas scored with his Tharangini studio and cassette production. The study of music in isolated classless societies is the ethnomusicology as defined by Alan Merrain in 1960. Gourley in 1978 defined it as a competing model stressing the act of performance . By mid 70s Clifford Geertz (1973) definition became popular .”The participants and producers of cultural phenomenon are one and the same that man is an animal suspended in webs of significance he himself has spun” The Indian films are oligopoly of corporate producers , produced for the low class Indians according to Peter Manudl. And popular film music in early period was attached to this industry. A record is a commodity subject to new dimensions of economics , to commercial mass market pressures and incentives and music is taken from the people and returned to them as a commodity . People are alienated from their own talents, deprived of warmth and solidarity.(In other words the folk genres replaced by film music ). In oral cultures traditional oral communication, reception and personal interaction are inseparable. Popular music has unifying , centripetal nature promoting a cosmopolitan universalist consumerism of values and tastes and this homogenization has its good aspects. A political ideology as well as a musical taste are both important in nationbuilding and modernization , a means towards achieving solidarity and a valuable tool for integrating diverse people into an otherwise impersonal and anonymous modern society. Jesudas and his Tharangini cassettes did this wonderful integration of people better than any political/social activist in the country.

In a bourgeois ideology mass media distances the producers from the customers/masses. The vast and diverse body of regional , pararegional, devotional and secular genres and lovesongs from Yesudas made it possible to fill the gap between the producer and the mass. To every one who listens to his music , he became the beloved Dasettan , not a distant producer/a bourgeois distanced from people. This happened because of his music as well as his personality which I had discussed in a previous book.

(Without a stumble ,A book on the spirituality of music) He was not just a transmitter of popular tastes, but one among them. This unprecedented revolution in realm of musical aesthetics was done singlehandedly is another remarkable feat. It was just a person's achievement , not the achievement of an industry . The industry benefited by his music and charisma , rather than he benefited from the industry (a mutual relation but with a predominance of achievement for an individual so that the entire industry benefited). The cassette industry had a new pattern of ownership , control and access and production .

Karl Marx remarked that an object does not become a product until the act of consumption. The consumer interpretation is based on intangible parameters like style, melody, rhythm, musical meaning, and renders analytical consumer interpretation difficult. Listeners interpret songs which are irrelevant and even contradictory to producers intentions. It is not a passive mode of conception . *Anthakshari*, collective singings, family singings etc has to be considered in any holistic appraisal of popular music and mass media and then we realize that Jesudas is one among the family/among the people /among any listener group/of any age/sex, a popularity which is not there for anyone in Kerala in any field.

Another way is to interpret cassettes as an international recording industry. By 1970 cheap compact cassette recorders came into common use in the developed world. Cheap portable durable than phonographs with vinyl record formats. Simple power requirements, repair relatively easy, and mass production incomparably easier and cheaper enabling lower income groups to enjoy access to both production and consumption of recorded music made this the most popular format in the US .Decentralisation, diversification, expansion of recording industry was happening uniformly throughout the world, except in the soviet block , where the imported parallel market was considered a luxury. It was at this time, that Jesudas started his Tharangini studio , one of the first in India to start the process here . Actually he introduced this global feature to Kerala. In Indonesia from 1960 onwards (a decade before India) cassette companies had been functioning.

Organisations of musicians , such as Nigerian musician union (PMAN) have vehemently clamoured for copyright protection against piracy (Collins 1985:119) Indian phonographic industry (IPI) is a organization for recording companies along with IPRS (Indian performing rights society) It protects the interests of the industry and investigated with many police raids against pirates since 1984 copyright Act. As a common listener I was not aware of such organizational activities till one day one of the media persons told me that I have to be careful in my relationship with Jesudas and he will make your house searched by police. I could not understand what he means by that. Why should jesudas search the house of one of his best listener /rasika and friend ? Probably the mediaperson was meaning that jesudas is part of this IPRS and that he may think that I am hearing pirated music. I was really amused at the thought.

IPRS holds the mechanical and performing rights of artists that are registered to it. It is the Indian counterpart of ASCAP and BMI in US. Attempt to collect royalties for its members from recording companies that use their material , as well as from hotels , restaurants, concert halls (who play taped

music before film shows included) and performing artists who play such recordings. In 1970 there were 700 members (individual members) of composers, lyricists, involved in film music. The lyricists sell the copyright to film producers and they sell it to a music company . Singers and musicians get flat payments , not royalties. These factors restrict the expansion and effectiveness of IPRS. I 1990 cassette manufactures association was lobbying for reduction in excess duties . Indian music companies association (IMCA) and a dozen other large producers promote pirosecurity of pirate affiliates and lobbies for revision of tax copyright codes.

Piracy in India is in three forms

- 1.Bootlegging . Marketing of unauthorized recording of a live performance
- 2.Dubbing of selected requested songs for individual customers
- 3.Unauthorised duplication of existing legitimate recordings for mass marketing which is the greatest concern for legitimate producers

I had some recordings of Live performances of Jesudas made (his rare Melakartha raagaas –some at least –for study and research , not for marketing) and has requested several of my friends to give a particular song recorded and they have given it too, without knowing that it amounts to piracy . But it never had been for marketing/sale but for individual sharing and hearing. All of us might have done this without knowing that it also comes under the definitions of piracy. But the third one is the actual problem for the music producers and it is a legal problem in India.

For a pirated cassette there is no sales tax and no excise duty while a legitimate company has to pay 75 % for exporting the product, 26 % as excise duty, 15% as sales tax and std 13% as royalty to copyright holder (in case of film music). That is there is 55 % advantage for a pirate over a legitimate producer in the industry. The major cassette producers myopically exacerbated the problem by increasing the price of their cassettes. (This amounted to collaboration with the pirates ). The pirate cassettes fidelity and durability are inferior , but it was cheaper too and people started buying the cheap pirated ones and this had a bad effect on industry. Before 1970 , Indian studios had inferior recording equipments and listeners were accustomed to the distorted timbers. And also to mediocre cassette players in poor conditions. Before 1984 there was no penalty for piracy and updating the copyright law took several years . In 1980s, 95 % of music market was with pirates and major honest music producers had great losses and smaller ones were faced out of market or induced into piracy to survive.

The reform demands:-

- 1Abolition of requirement that 75 % of domestic production be exported
- 2 Abolition of the 26.75 % excise duty
- 3.Advancement of Copyright Act to enable it to contend with cassette piracy
- 4.Vigourous state enforcement of the Act.

In March 1984, the excise duty was abolished. A few months later export requirement scrapped. In October 1984 it was revised with special provision regarding tape piracy. Requirement that every commercial cassette must exhibit the name, address of producer, copyright owner, publication date of product and 6 months imprisonment and 50000 Rs fine for pirates and the offence is nonbailable. In 1991 market survey by IPI 40 % of domestic market was still by piracy. And legitimate producers were reaching bankruptcy.

This is something all of us, listeners/music lovers and consumers should know to understand the problems of the producers and to decrease the piracy of the nation by not buying pirated cassettes. When Vinod Jesudas was talking about copyright laws, the media was attacking that youngster without considering these facts, and it was that which prompted me to read and understand about the cassette industry, its organizations and its problems etc, and I could then understand the losses suffered by Tharangini and its causes and by it I could also understand the personality of Jesudas better. To understand a person more and more is to love him more, I think. That is what we Indians lack, in the present age. Every one slings mud at everyone else, if possible through the media and do character assassination, which is not good for anyone, or to the nation either. Criticism should be based on facts, not on emotions and on selfish motives is a lesson every citizen should learn. Respecting others and understanding them and thereby trying to love neighbours as Thyself is not an easy practice, but has to be cultivated by any civilized society.

#### AIR and film culture

Indian radio started in 1927 with transmission from Bombay and Calcutta and in 1930 only the British could broadcast. By 1947 there were 9 stations and between 1952-57 under B.V Keskar the information and broadcasting minister, AIR banned film music. In 1957 film music was reinstated in the new channel *Vividh Bhaaraty* after discovering that the listeners were tuning to the powerful Ceylon and Pakistani stations to listen to film music. Film music was in India from 1940s. Visual music was synonymous with film music. In mid 40's playback singers became a must in films because people loved films with music, and many of the viewers were coming to listen to music and they needed good music from professional singers. The noutanki, jathra type music, folk songs and lovesongs were liked and it was transcending the barriers of language to reach a broader audience. Indians (including Jesudas, our musical icon) were too poor to own a radio and listen to music, and people viewed films several times to learn a song, and covers of the records showed the hero or heroine, not the singer. The singers and composers were not stars themselves at that time unless they were heroes too (Like TyagarajaBhagavathar). They were invisible voices singing for actors. They were cogs in a system oriented permanently towards production of films and the lack of freedom and control was complete for an Indian musician, removed from the visual picturization and cinematic context. The contribution of the musician was embedded in a capitalist production network. Yet the film music was aesthetically beautiful, expressive and very popular. It was a studio-bred art and live performances were unimportant. The singers did not cultivate

a stage presence . According to Peter Mandl (pp 52) Latha sang in 18 languages but only in one style-the shrill falsetto , the one style imitated by all the female singers after her. According to him it is a girlish destructive voice and according to Anil Biswas she was the only professional singer in Bombay who can learn songs so easily. Music critic Raghavamenon (1989) said her style is the ultimate measure of sweetness in a woman's voice and her technique narcotized all forms of light music .This was not a style created by people but by a single artist and cherished by millions of Indians and from a corporate act , it became a mass act by a single artist . Jesudas in South India had several live performances in his early days and still he continues them very occasionally. Wherever he goes he is a crowdpuller, better than any other cineartist or politician and he is having different styles of singing suitable to different occasions, different actors, and his innovative singing has been acclaimed by almost all music directors and his voice is not an impersonal voice for a listener , it is very personal, always loved and cherished for its beauty, its melody and its compassion as well as to the character and personality , and ideals of the singer. Not even Latha or Rafi had such a social acceptability like yesudas. They remained musicians throughout, but jesudas the philosopher/musician/social thinker/cassette revolutionary and producer has multiple personality factors accepted and cherished by all his listeners alike irrespective of caste/creed/sex/religion/language. The cassette revolution he started in kerala ended the hegemony of GCI and cottage cassette companies proliferated to create a mass homogenous market.

Energetically recording and marketing all types of little traditions , regional music, which was ignored GCI and by film producers , for a variety of special target audiences in terms of class , age , gender , ethnicity, religion he expressed the incomparably diverse voices of the nonelite average Indian .

The financial and technological aspects of cassette industry as a collage producer with makeshift studio at home, with a local harmonium player and a thabala to accompany the singer who may record free in order to become known , the capital investment was 2 cassette recorders for initial recording and the subsequent dubbing and a microphone. A studio can be rented for 250 Rs/ hour . Artists got merely a flat free of a few thousands. Producers were making profits out of records. Performers though aware of the unreliability of royalty payments could not anything about it and even HMV was not paying royalties in time. From that state of affairs , if the performers in Kerala and also in South India has had some improvements it is because of the status jesudas made for them as a superstar singer and as a cassette producer. Before the advent of Yesudas , playback singers were not getting their due and were illtreated by low payments . He gave a status to film music and musicians by his mere presence , respectability, accountability and quality of music.

## Devotional music

A new alternative to the corporate controlled cinema and staterun broadcast media disrupting the monopoly of HMV and gramophone company and the film corporate world came the multitudes of devotional cassettes from Tharangini, loved and cherished by the public. It was a unique logical event in the realm of international popular music. The flourishing diversity of devotional music played a central

role in the cultural life. In India music has always been playing a central role in Hindu Indian *Bhakthimarga*. The Christian devotional was at the margin of the mass media only and Muslim devotionals at the peripheral of it, as said by Peter Manuel (pp105) in his book on cassette culture. Holistic comprehension of massmarketing of devotional music in India entails a study of relationship between mainstream panregional genres and diverse little traditions between life performances and mass mediation between an emergent commercial subgenre and dominant secular entertainment style. It is in this field the genius of Jesudas stands out prominently. The volume of devotional music Tharangini brought out in different languages and the devotional passion he exhibited sometimes amounting to a sensuous erotic passion in his *bhakthi*-laden voice was interpreted by audience in variable shades but everyone liked it.

Devotion or *Bhakthy* is ubiquitous, heterogeneous and fundamental to Indian culture. The innumerable *keerthana*, *Geetha*, and *bhajans* in India bear testimony to it. The different *bhakthy* styles of music were cultivated in different temples, both in south and north and each has its own ethnic beauty and attraction. There are different *Bhajanmandalis* in south and North with distinctive styles right from ancient days. The styles of M.S. Subbulakshmi and of Chembai Vaidyanatha Bhagavathar in the south, if you notice closely are so different but both have the inherent passion of love to God and that was one unique common factor which united all the types of music in the country. In mid 70's Mukesh recorded entire *Ramacharithmaanas* in North India in LP record combining classicism and *raga* styles with traditional instruments only. This is considered as the first commercially marketed devotional recording in India to achieve true mass appeal. Jesudas has started to make devotional cassettes almost at the same time in South India with larger accompanying ensembles, but avoiding metallic instruments and using violin, discoinfluenced rhythms in some of them, and all of them were hits in the commercial markets. Later this trend was imitated by others, but till date the success never had been so great as that of Jesudas and his Tharangini cassettes. Film music has a temporary nature and except a few of them, many are forgotten after sometime. This temporary nature is not there for devotional music. As long as there are devotees the devotional music survive.

If we draw a triangle, at the apex is the classical music which is perennial and permanent but accessible only to a selected few, due to its aesthetic and highly intellectual nature. On the base at one corner the devotional music, also permanent, and popular as well as classical/semiclassical accessible to middle class, and filtering to both the classical music lovers and to the common man of the masses who love film music. And on the other corner of the base of triangle is the popular film music which is loved and accepted by common man (public / masses) and in which both classical/semiclassical/devotional trends can be incorporated so that their tastes can be improved. The success of Jesudas as a singer is that he could handle all the three corners of this triangle well and his Tharangini produced music for all these strata of society, percolating into boundaries of all fields without difficulty so that the boundaries merged and became one, a musical *Advaita* state. The soft and subtle timbers of Jesudas aimed at the middle class audiences could not be imitated by others so easily though every singer after him has tried his best to do so. The intermediate transitional genre of ghazal, light music, folk songs, romantic numbers etc also were produced and the middle class and the masses enjoyed and loved them.



Devotional music has a mystical content , and in this respect it has a secular nature and the text content is aesthetic with attendant extramusical associations of *bhakthy* within the listeners heart. The bipolar model of Indian music is a way of life for the Indians. The court or *darbar* music of royal palaces and the *bhakthy* music of the temple are both classical traditions of India created by the same *Guru/Bharatha* and his disciples. A performers stage presence can suggest either of these two, or that of a third one , the courtesan. The court music has a refined diction, imagery , romance and nostalgia, a cultivated virtuosity , and historical roots in an elite cultural past of India right from Mehrgarh/Harappan period. This style was modified in North India during the Mughal sultanate period. The bhajan has a singers personal image , the stage presence, performance style to support his music. The performer need not be a saint /sage /ascetic but his personal life has to conform to certain standards. As Wadhera said about rendering a bhajan “The devil cannot cite scriptures”. *Bhakthi* is a simple accessible emotion and the appeal rests on the melodic singing and the emotion expressed by the singer . It has immediate and favourable impact on listeners . A rich devotional concert affects the listeners with the strength of the simple style and the *bhakthi* itself. It is soulstirring and sincere devotion combined with love for the artist that affect the listeners and that is why the personal life of artist should have certain standards . And jesudas kept those standards well throughout his life. (Probably consciously trying to keep up the image ). One has to just attend one of his concerts to see how he relates to his listeners with his *bhakthi* style , both classical, semiclassical, and bhajan music.

Enjoying a panregional culture is what we call great tradition. The language, sects , classes , tastes etc have a diversity and such little traditions of music is attended to by him with equal importance so that all languages and all types of music listeners can enjoy his singing. Such a diversity of musical production is the hallmark of Jesudas, and not even the heartthrob of multitudes, Latha Mangeshkar has produced such variety of music in her lifetime. (It is true that Latha has produced Bhajans in 18 languages, abhang in Maharashtra style, and that of Meera, Kabir, Surdas, Narsin Mehta etc but her popularity is not because of that , but by her film music, remains a fact). The yoking of great and little traditions is another musical *advaita* Jesudas has achieved . The richness of folk traditions as across section of different types of *bhakthigeeth* in different languages in the subcontinent by one single individual in itself is a topic that needs a thesis /research work .The classical *bhakthy keerthana*, functional *bhathi geeth*, and others not attached to any specific rites, traditional *bhakthi naamaarchana*, the rendering of *Bhagavad Geetha* and the *Rgveda* and such other *Mathu /dhathu* compositions are numerous to list . Music for building temples, for charitable institutions, for local specialized regions on sectarian demands and taste and concerts and *gaanamelas* along with the innumerable number of film music, Jesudas had been a most sought after singer for more than 50 years throughout his career in the subcontinent. The tolerance and respect for and from all religions, sects, castes and gender helped his marketing and cosmopolitan range of products. Jesudas had composed a few songs and *keerthans* including a *varnam* in *Amrithavarshini* to his credit and he had done music compositions to several of his songs both in films and light/devotional albums which is a quite unknown fact to several of his fans. The versatile genius and personality of this wonderful human being will remain a legend in India forever. Yet , in course of my research I came to understand that his contribution to Classical Music of India is minimal though he is capable of contributing to it . And through our conversations I could make him realize that he can

contribute by singing rare Raga and popularizing them , so that he can preserve them for future generations .

We are living in a world where live performance is replaced by cassettes. Even *manthras* are available on cassettes replacing need of priests. And in such a world, the fans of Jesusdas still want to see their Dasettan doing a live performance and in December season they come from all parts of India and the world to attend to at least some of his Kutcheris. The dehumanization and impersonality of cassette culture is overcome by his charismatic personality and the love and devotion his fans have for him. The stylistic variations he makes on the content and the raga to give a new aesthetic experience each time , and on each stage is something which a perpetual listener of him like me always looks forward to. The cassettes of such live performances would be very valuable as ethnological documents and sources of teaching material, entertainment and preservation of culture , if they have been recorded . The same keerthan at two different stages will be giving two different experiences due to various factors involved in singing, in moods and the stage condition etc .The negative side always raised by some is that the cassettes invigorated the trend to *bhaktimarga* , rather than to *karmamarga* and *gnaanamarga* .I have to ask some questions to proponents of this view.

1.Isnt it *Bhagwan Vishnu* who said that in *kaliyuga*, *bhakti* is the best route to God , than *karma* and *gnaana*?

2.In *Geetha* and in *Sandilyabhakthisoothra* , has it not been proven categorically that true *bhakti* and *gnaana* are not different?

3.The love /*bhakti* and knowledge/*gnaana* makes a human being a better individual and then his works/duties or *karma* also become better. Without *gnaana* and compassion our *karma* are useless to society.This is proven by Upanishads.

4.Then why lament that *bhaktimarga* is inferior to *gnaana* and *karma*? The *advaita* of the three *margaas* (*marga* just means the way) has to be understood. The goal is the same .

5.As long as the devotional state does not become excessively dangerous to injure society/other members of society it is good. And even knowledge /and *karma* has the same principle. Our doings, our knowledge as well as our devotional pursuits should be useful to society . Not harmful. If this criteria is fulfilled all ways are good and if not, all are bad.

We have heard so much about the politics of parody in folk and film music. Parody means setting a new text to a borrowed tune that already exists. In *Sangheetharathnakara* of *Sarangadeva* it is called *Dhathu*. It was practiced for several centuries in *Raga* music.The same raga has several *krithi/keerthana* by several authors and in strict sense this *dhathu* music comes under parody. The devotional music of Jesusdas in different languages (lyrics by different authors from different languages) but with the same tune may be classed as *dhathu* music. According to Scott Marcus manuscript 1991 , musicians help mould the regions selfimage as a dynamic subculture that is modern and at the same time linked to

traditional ancestral roots .A Malayalam song coming in the same tune in Telugu, Kannada, Tamil encourage a national integration . In 19<sup>th</sup> century Europe there was a dissociation of composers from the guilds and feudal patronages .The guilds and patronages of composers/singers was a regular feature in ancient India. The compositions in Indian society were prized as valuable possessions of their creators and guild associated and the patrons. They were exchanged as dowries with the royal women of the guild/patron/Guru (creator) and the vocalist Guru cherish a disciple who can protect them .The exchange as dowrie of music and musical instruments can be seen as evidence in scriptures as well as in some Indus seals with a musical script. The notation (the *krama* of the swara) as anthologies of each Gurukula was precious right from *saamavedic* period. Each school had a *baani* (*paani*) and the British Govt made it the copyright law of colonial India. So the guild/patronage was an Indian system the British got from India.The Indian law and western law are different. The west permits changes only with the permission of the original copyright owner. In India just notify the holder of a product of a cover version with nominal royalty (5%of retail). If melody alone used as in parody the rate is 2.5 %. The traditional folk melodies and *keerthans* are not copyrighted The companies are supposed to register with the copyright office but many companies do not bother to do so. The state television agency do not pay royalty on music whose rights are held by IPRS members. Agitation within music industry to allow composers and lyricists of films says to get royalty . It is generally paid flat sum by film producer who then retain the copyright to the music. The advent of cassettes blurred the dichotomy between commercial music produced by a corporate entertainment industry (film industry) and folk music .It created a form of continuum of music and industry ownerships transferred from corporate to rural individual entrepreneurs as well as the form of music itself. In this way, Tharangini made a new impetus shifting the industry ownership pattern, and Jesudas' entrepreneurship gave a status to music and musicians .The dramatic change in elite ownership pattern of music industry , and the founder coming from economically poor strata of society (a proletariat class) breaking the corporate elite boundaries of ownership has not happened anywhere else in India , except in Kerala .

Romantic love is an inexhaustible subject to every human being .The Indian music with its high romanticism, nostalgia, love in separation, seasons, nature, fields , forests , mountains, *vasanthotsav*, rivers and oceans and sky and the several mystical/erotic spells of love between Radha and Krishna and the balance of female/male principle (*sivasakthy*) had been a mass philosophical discourse from time immemorial .This echoed in religion, mysticism, spirituality, ecology, migrant labours, sociopolitics of loneliness and domestic life /*samsaara* has been the center of human life in literature and music right from prehistory to modern period , a continuous spectrum of aesthetics and enjoyment .The mystical desire for Krishna ,as neverending union of *Jeeva* with *Paramathma* , sometimes touching the erotic side of common woman/man relationship is the most favoured subject in music of all times in India.The various shades of emotions in this *bhaava* rendered by Jesudas in his music is something which baffles the mind and takes us on a tour to bygone days of Krishna and Radha. This subject again is something which needs a better handling as a separate subject of research and in this general study pattern , it cannot be included. I can just suggest some possible and probable research subjects a university student of posterity can do with the music and personality of Jesudas. As a part of the research I went to *Braj*,

where the *Braj* culture exists at *Mathura* as nucleus , with towns of Bharathpur,Agra,Alighar,Banchari at borders and 75 % of people in villages speak *Brajbhasha*. The center of the Krishna cult from 3<sup>rd</sup> millennium ..The *rasiya* cult during Holi in Barsana and the *krishnaleela* cults are still vibrant there. The *rasiya* as a regional little tradition of Braja is now a universal feature in all Indian languages and all over India and mainstream Hinduism and its *bhakthymarga* has imbibed it in its music and dance and temple traditions. The devotional rasiya tapes are sold at Brindavan. The devotional music of Yesudas on Krishna are so much and of several shades and in many languages and the emotions in it can be compared to the little tradition of vraja .The Ayyappa devotionals of Kerala as a little tradition of Kerala is also another subject worth researching by University students in music colleges and academies. So too his renderings on Ganesha, and Devi Mookambika are specially devotional and different from others.

Musical movement created by Jesudas from early sixties was not only technological but sociopolitical. The very use of different languages for the same melody, has political implications of integration, in a nation with multiple languages , and linguistic policies are subjects of demonstrations and riots. In a nation where unity is fragile with diversities in languages, and religions Jesudas became an icon of unity of languages and religions just through his musical medium of expression. All *bhakthi* movements are also sociopolitical movements in history. The *bhakthi* movement of jesudas has a sociopolitical *advaita* and national integration and message of unity of all castes and religions .Both *Aasthikaas* and *naasthikaas* (right and left wings/ believers and nonbelievers ) use his songs and both secular and religious people cherish his songs and this has helped to bridge the gap between different groups. Being a admirer of Sree Narayanaguru , the proponent of Advaita philosophy , Jesudas has shown the advaita both in his profession (music) as well as personal life which has sociopolitical implications.We have several great musicians other than Jesudas. But they could not make a sociopolitical as well as musical impact and give a message of Advaita both in life and profession. This judgement of Jesudas as a human being and as a singer comes from my research over several years on his music and personality.

When I started my research,in my early years , I rated Jesudas as a great singer and as a demigod. And when I end my research I rate him as a greater singer than I thought him to be , and as a normal human being with so many natural human weaknesses and not a Demi-God at all. This gives more beauty to my understanding of him as a person . A demi-God is less lovable than an ordinary human being .

(This chapter is based on the book Casette culture .Popular music and technology in North India by Peter Manuel Oxford uty Press 2001.,which is a well researched book on North Indian music industry.)

Evidence for support of antiquity of Indian culture is both literary and archeological. Here the *saamasthuthy* of *somayaaga* and its musicality is discussed for the antiquity of the art and science of musicology in India. *Saama* is interesting to not only the musicologist but also the ritualistic and the literary persons and philosophers and also the astronomers and mathematicians. *Rgvedic yoni manthras* are the evolutionary point of *saama* chants. Whether they were tone accents or pitch accents in *Rgveda*? Probably the latter. But in original *Rgvedic* account we find a stress account and then later on a pitch accent. *Saaman* chants are melody characters and has *anudatham(ni)* , *udatham(sa)*, and *swaritham(ri)*. There are three traditions of chanting *saamaveda*. *Kouthuma*, *Ranayaniya* and *jaiminiya*. To know the technicalities of the *saama* at least 5 branches of books are to be studied.

1.*saamathanthra*.2*Aksharathanthra*.3.*Pushpasuthra*.4.*Mathralakshana*.5.*Dharanalakshana*.

Saaman notations by numerals and letters is as follows(modern)

1	2	3	4	5	67
Ma	ga	ri	sa	ni	dhapa
F	E	D	C	B	AG

(But in the *aksharasamkhyā* of Sanskrit Sa is 7, Ri is 2, Ga is 3, Ma is 5 , pa is 1, dha is 4 and Ni is 0.

In south India the 5<sup>th</sup> is known as *Mandra* , 6<sup>th</sup> as *anuswarya* and 7<sup>th</sup> as *athiswarya*. In *saamathanthra* instead of numerals of 1,2, 3, 4, 5 we find *ga, ja, da, dha, ba* used. ( In Tamil , these are pronounced as Ka, cha, ta, tha, pa.) The last or *anthya* are not mentioned. First is *krishta*.or *prathama*. 7<sup>th</sup> is *vikrithy* or *premkha*.

1<sup>st</sup> three notes 1,2,3 are *na,ma,na*

1 and 2 are *vinatha*

4,5,6,7 are *athyuthkrama*

2,3,4,5 are *samprasarana*

All notes are called *karshana* (Which does *Karshathi* function, or function of attraction.This *dhaathu* or root gives rise to the word *Krishna* and to earth also in Sanskrit). When Krishna repeats his *swara* as *Geetha*, what happens? *Abhigeetha* means repetition of a note marked or numeral 7 in *Vedam* chanting..

In *saama* pronunciation there are two types . One is called *vridhaswaram* which is an emphasized *swara* with 3 *maathra* and in every *parva* the *anthyaswara* is *vridhaswara*. The other is a *dheergaswara* where the *swara* is prolonged so that the *mathra* is increased as *vridhaswara* but there is no emphasis but musical prolonged pronunciation. The present descending *sanidha* order started from the *kouthuma* tradition.

Descriptive catalogue of the Sanskrit manuscripts , in Govt oriental manuscript library Madras vol 1 (1901-5) pp77-78,c alls the 6<sup>th</sup> note or B flat as *kaisikinishadam*. 7<sup>th</sup> as g or pa, and if these 2 are avoided the melody of *samaveda* has a uniform structure and is identified akin to *raga abhogi* , a derivative of the original *kharaharapriya.sa,ri,ga,ma,pa,dha,sa*. For *abhogi* , *ga* is *komala*, *ri,ma,pa,dha* is *sudha*.symbols/notes are uniform in all places whether handed down from ancient period or not but regional differences in singing *saamaveda* exists . *Ranayaniya* school of *Hosakole* has no *Ni* in *sama* chant but in all other traditions it is present. *Kouthuma* tradition of south India has *ga* flat (*komala*) *ri* (both flat and *theevra*) *sa,ni* (flat) and *dha, pa*. About the technical experiences in *saama* chant the *pushpasuthra* says about different methods.

1.*udooham* is two *swara* above that is, 4, 5, 6 is as 1,2,3.

2.*udharam* and *lopam* from 1<sup>st</sup> to 5<sup>th</sup> two *parvanas* are taken

3.*Upagraha* used as *nidhanam*.Vowel e (as in emperor) is chanted before *nidhanam*

4.*Upaayam* are of two types.*Vaa* is the *stobha* as one. The other is called *upadravam*.

5.*vidham*.is the part of the verse of the song.

This could be either *parvanam* or *parvam*.

For *pushpasuthra vridheswaran* or *vridhaswara* is a particular sequence of notes, a special kind of *karshana* consisting of a *prathyutkrama* beginning with the third note. *swara* could be a final *swaritha* syllable ending in *nidhana* or in *samaparibhasha* the *anthyakshara* or last letter of *nidhana* having a definite sequence of notes. The *swaritha* of *Archika* corresponds with the *karshanaakshara* (attractive letter) of *yoni* and the *swara* 1-5 of *ushas*.(dawn)

ARCHIKA.	YONI	USHA	SWARA/NOTE
swaritha	karshana	swara	1-5
anudhatha	No karshana	swarya	2-5
prachaya	No karshana	swarya	2 or 3 upto 5
udhatha	Udhatha	vridheswara	

*Krishta* or *Ni* is the highest and *athiswarya* is the lowest note. The *krishtaadi* scale is:

*Krishta prathama dwithiya thritheeya chathurtha mandra athiswarya*

*Ni dha pa ma ga ri sa*

*Prachaya* is said to be of indefinite pitch , toneless as distinguished from *udatha*, *anudhatha* with definite tones. Before ascending to next *udatha*, *swaritha* from *prachaya*, the sound show a minor descend and that is called *sannatharam* or more lowered note, *anudhathatharam*, or below *anudhatha*. That was how the original recitation was done. The 10 authorities for the scales of samaveda are

1.*Rikprathisakhya*

2.*Brihadhevatha*

3.*Thaithereeyaprathisakhya*

4 *Saamavidhanabrahmana*

5.*Pushpasuthram*

6.*Saamathanthram*

7.*Saamaparibhasha*

8.*Mandukisiksha*

9.*Dharanalakshanam*

10 *Naradasiksha*.

Of these the first 6 are very ancient.

According to *siksha* ,

*Ma ga ri sa ni dha pa*

*Swaritha udatha anudatha swaritha udatha anudhatha swaritha*

Here it is noteworthy that *siksha* though a teaching on grammer, does not have a grammatical meaning but a purely musical meaning . *Udatham* is terminal of tetrachord at *ga*, *ni*.

Above *swaritha* only relative pitches *samapa* is *swaritha*.

*Anudath* is below and is not the indefinite pitch but very definite *ri*, *dha*.

In musical eminence *ga,ni* is given a higher or *udatha* state above all others (not in pitch but in eminence)

*Athiswarya* is the scale downwards , the extremity of the cadence , the lowest note of the full scale.*Kouthumar* used initially 5 notes and then the *krishtam* added as 6<sup>th</sup> note and *athiswaram* as 7<sup>th</sup>. Thus 7 swaras were categorized. The music is purely vocal chant. The instruments for demonstration and as accompaniments only. In vocal scale the telling notes of the voice are in the upper register (starting point of vocal scale) and then descend downwards therefore an *avarohana* vocal scale established .The 4<sup>th</sup> before the 5<sup>th</sup> , the tetrachord before the pentachord.

*Prachaya* is not indefinite and it is called *ekasruthy* or same tone . An *anudatha* after *swaritha* with same *sruthi* . Last of the *prachaya* syllable formed by *udatha* or *swaritha* rendered as *anudhata*, the original lower tone.

*Rgveda* use a vertical line above syllable to denote a raised head *swaritha* and lower as *anudatha* . *Paanini* and *Naradasiksha* and later *Abhinavaguptha* ( before him *Bharathamuni*) used *Samapa* with 4 *sruthy* each or *chathusruthy udhatha* total 12 *sruthi*

*Ridha* 3 *sruthy* each *thrisruthy swaritha* total 6

Gain 2 *sruthy* each *dwisruthy anudhatha* total 4 *sruthy*

Thus *sapthaswara* had 22 *sruthy* as given in all these ancient authors and is not a new addition by Venkatamakhin as the permutation combination of *Melakartharaaga* .

*Garisani* is the tetrachord of *kouthuma saamaveda* tradition.. And they had known that in *swadhyaya* there could be *roopanthara* in *swarupa* of *swara* and utmost care is needed to prevent it by any serious student of *samaveda*.

The Indian music of vedic and classic period was studied by Dr Erwin Felber in cooperation with Bernhard Geigers.They took 68 phonogram plates by Felix Exner (1904). 5 of them were ritualistic songs. Felber published the study in 1912. The *akshara,swara,sruthi* etc in different parts of India are not according to the vedic textual numbers , they reported , and there is variation from place to place and experimental changes in melody are there in various singers dictions. Different schools teach differently and even the number of tones differ, but original character must have been the same and the changes are minimum, and pattern of employment of notes in each school is similar. This was the conclusion. He gives the view of Hang that *Udhatha* and *Madhyama* tones correspond to the tone of everyday language. These two joined ,and then slightly above *udhatha* comes *swaritham*. *Prachaya* is as high as *udhatha*, only a little less voiced. The songs from folkmusic adopted and the texts are arranged accordingly by musicians , he noted. Burnell calls this *vikrithy* and feels that it is comparatively modern in origin.

The view of Simon is that oldest are 1-6, the 6 notes *prathama, dwitheeya* etc, 7<sup>th</sup> is *abhigeetham*.(In folk music the first 3 notes were first recognized in *Rgveda*, and by *samaveda* the 7 notes were recognized to have 22 *sruthy*.)



Vedic chant studies were done in textual and melodic form by J.M.Von der Hoagt in 1929. Quoting *Satyavratha Samaasrami* he gives *sthobha* as *varnasthobha*, *padasthobha*, *vakyasthobha*, *Adhikatwesathi rigvilakshana varna:sthobha* (by strength or increase in *akshara* the pronunciation differs producing *varnasthobha*). *Vakyasthobha* are of 9 types and *padasthobha* 15 types. *Vakyasthobha* means a small phrase which contains an idea , and in this respect it is like a *ribhus* or a ideograph/pictograph. We must remember that the Indus script had all these *sthobhas* in pictures. *Arkapushpa* is an example for *vakyasthobha*. It could be a flower, sun, or the water and flowers as offering to God, or guest, sign of prosperity and so on.

The 9 types of *vakyasthobha* are as follows:

1. *Asisthi*

2. *Sthuthi*

3. *Samkhyanam*

4. *Pralayam*

5. *Paridevanam*

6. *Ppraisam*

7. *Anweshanam*. which means mental research, speculation, speculative interpretation as in *Adityavrathasaamam* where sun is called the fuel of the *devaas*. Sun is here a metaphor as well as the energy principle.

8. *Padasthobham* as in 13<sup>th</sup> ch of 3<sup>rd</sup> book of *Manthrabrahmana*. The word *Pushpika* as an example .which is a repetition of the final word of a chapter.

*Kouthuma* school sometimes uses number 1 for both *krishta* and *prathama* and 1 is written for 11 , *krishta* tone. Fixation of intervals 1-2, 2-3 (tone degrees) space having several possible varieties, a distance of a semitone or of a minor third. *Vikrithy* is not always adornment . For the final tone of 5 as in

2            1 1 1 1 1 *Ba rheerashi* 2 3 4 5 (G.G.G.1/2 ) represents the keynote of the *saaman*. Rhythmic basis is in the verse itself.

-

2 indicate *vikrithi* and usually preceded by *prakrithi* tone 1. Generally followed by 1, sometimes by 2. *Vikrithy* tone 2 preceded by *prakrithy* tone1, followed by *prakrithy* tone 3. If symbol inverted v is put between *prakrithy* tone 2 and 3 , or between *prakrithy* 2 and *vikrithy* 3 , it means the tone 2 is variable. If a *pada* comes repeatedly in a melody one after other it is called a *vidham*. In every *pada* 2 or more *vidha* may be there. Something equivalent to a *ragamalika* . When discussing *bhakhthysidhantha* in *panchavidhasuthra* the laws of *prasthava* , *prathihara* and *nidhana* are given with examples. In *vibhagyasaman* , *bhakthi* divides *saman* in equal parts. If it is according to *pada* it is called

*padavibhagyam*. if according to *sthobha*, *sthobhavibhagyam*. *Padam+sthobham* gives *padasthobhavibhagyam*.

*Sthobha* increase the melodic effects and are very pleasing to the *devatha*.

(Comment: In *swadhyayamandala* edition of 1942 .Madras Ed of 1976, numeral 11 in second *parvan* , *krishta* and *prathama* are different) *Sidheswar varma* conducted some studies in the accentuation of the *saamaveda*. He noted that *samavedasamhitha* assigns *udhatha* as 1, *anudhatha* as 3 and *swaritha* as 3. He asks why lowest is assigned to highest tone? High grade must be the first . In *samaveda*, *swaritha* number is 2 which is *udhatha* of *Rgveda*.(when *udhatha* is the last , or when *anudatha* comes after *udhatha*)

*Udhatham* coming after a *kshaipram* is the product of *sandhi*. The symbol *plutham* (3) after a *dheergaswaram* (symbol 2 over *plutham* in *saamaveda*).

In *Rgveda* a subscript line is put beneath number 1 to show *anudhatha* symbol.

*Viramam*, *sannutharam* coming after *udhatahm* indicate both *swaritha* and *sannuthara* were accounts with reality in language. Importance of the study is that it gives the following lines for further investigation. Psychological significance of symbols like 3 Ka , 2 Ra, varied treatment of *kshaipraswaritha* in *Rgveda*, The exact shadows of pitch in *sannathara* and preceding *Udhatha*.

Comment: The *swaritha* of *Rgveda* is *Rishabham*. *Udatham* is *shadjam*. *Anudatham* is *komalanishadam*. *Swaritha* is in between *anudatha*, *udhatha* theoretically. In actual , the pitch of *swaritha* higher than *udhatha*. Numerical symbols of *samaveda* denote numerical pitches. In *Rgveda* does not. *Kshiprasandhi* vowels e,u, short or long followed by dissimilar vowels are changed to semivowels.

*Neelakandasasthry* discusses the origin of *samaveda* in detail. *Samaveda samhitha* has 3 parts .1.*Poorvaarchika*.2.*Aranyakasamhitha*.3.*Uthararchika*.

A *grantha* called *Pushpa* (*pushpasuthra*) consists of

1.*Gramageyagaana* (*ganam*)

2.*Aranyagaanam* (*ganam*)

Both of which are used in *somayaga*

And

3.*Uhyagaanam* ,the oldest part of *saamaveda* which is the laws for *uharupam*.

*Gramageyagana* are in *Poorvarchika*, and also *aranyagaana* . The *uha* , *uhya* are secret and seen in *Uthararchika*. *Swarupa* is the *prayojana* in *yagna* or sacrifice. That means music originated for sacrifice. *Purvagaana* are to be practiced everyday by musicians. The *uhya* is the secret of music or the theoretical part. *Pushpa* for a *pundit* of *somayaga* is an ornament or *alamkara*. For traditional *sampradayis* it is to

be understood as *Pushparshi*, the name of a sage. The development and continuity of Indian musical scale is discussed by Hulgur Krishnachariar.

*Archika* has one fixed note, *samika* has 3 notes repeated in 3 ways and *gaathika* as used at present. The old name of *swaritha* was *swaranthara*.

1. The scale which is repeated in order of sruthy

*Sa ma pa*

*Ma pa sa*

*Pa sa ma*

2. Then *chathuswara* was discovered.

3. Followed by *sapthaswaram*.

According to *samavidhanabrahmanabhashya* of *sayana* scale of notes of *samagana* are,

*Ni dha pa ma ga ri sa*

Named *krishta*, *prathama*, *dwitheeya*, *thritheeya*, *chathurtha*, *panchama*, *Shasta*.

*Naradeeyasiksha* gives another order *prathama* to *Shasta*, *krishtam* as 7<sup>th</sup>

*Ma ga ri sa ni dha pa*

*Dwitheeya* is *Gandhara* which can contain *chathusruthy*.

U denote *deeptha*

Inverted V is *aayatham*, when *dwitheeya* comes after *thritheeyaswara*

Star sign *karunam* or *krishtaswaram*

In *Atharvaveda*, according to M.S. Ramaswami Aiyer *swaritha* is called *akshiptaswaram*, or persistent constant.

*Gandharakomadhyama unchajaatha*:

*Shadjarshabho duo nihathodbhavostha:*

*Sapanchamo dhaivathako nishada:*

*Thraya:swarascha swarithanthu jathaa:*

*Ga,ma from Udatham*

*Sa,ri from anudatham*

*Padhani swaritha*

If 24 *kampana* are in *sa*

In the ratio 3+3+2+4+4+5+3

*Sa ri ga ma pa dha ni sa*

24 27 30 32 36 40 45 48

In *Archika* , *Agnimeele Sa* 16 times, *ri* 7 times, *ni* 5 times. Predominant is *sa*. Therefore called the only note. In its *samaganam sa* 59 times, *ri* 30 times, *ga* 45 times . All the 3 are predominant. Also in *parkasaman*, *garisa* predominant

*Magarisadha* the *saman* scale with *maga* flat *ri* sharp

Swara	sruthi	sruthimulya	ratio	Sruthijathy of Narada	Sruthijathi of sarngarava
MA	marjani	13	4/3	mridu	Madhyam
GA	varjika	10	6/5	deeptam	Deeptam
RI	roudri	8	9/8	“	“
SA	chandovathy	4	1	“	Madhyam
DHA	ramya	20	5/3	“	“

When sama scale starts in *ga* instead of *ma* , since *ni* is *kaisikinishadam* flat b *sruthinama* is *theevra*. In south Indian *Gouthama samaganam* , *Garisa* is predominant. This is not pointed out by RamaswamiAyer.

*Sari chathusruthi, ni flat dwisruthy, (In S. Indian Gouthama ri komal)*

In the 7<sup>th</sup> All India oriental conference Dr Arnold Blake pointed out that the recordings of Dr Felix used earlier was substandard and does not show the pure traditions of *saamaveda*.. Felix had recordings of 12 yr old son of *satyavrathasamasrami*, of *Krishnavratha* , a Bengali Brahmin, *Lakshminarayan sharma* , a priest in Calcutta from Jodhpur, Subramanyasasthry of Thanjavur officiating in Madras and all were substandard ones. Therefore the conclusions of variations changes etc earlier noted had to be reassessed. In *Rgveda Manthraswara*, in *yajurveda Bhasiswara* (spoken, recited, even murmured) in *samaveda saptaswara* (octave ) are used. *Manthraswaram* is accentus in Roman catholic liturgy. *Bhasiswaram* is lections and *samaswara* is Gregorian music.

The oldest pronunciation is the 6 notes of Kerala *Namputhiris* which is not seen in *Jaimineeya* according to Bake . For the *Jaimineeya nambuthiris kampana* in minor swara are more and predominant. The *swara* are more audible and no *kampana* . In *Jaimineeya* the oldest is that of the *Namputhiris*.

The mode of singing *samagana* according to L.S.Draavid who belongs to *Ranayaneeya* school and sings *samaveda* with an accompanying *thambura* is as follows:-

#### ANCIENT

1Sama scale	1	2	3	4	5	6	7
2.Indian music	ma	ga	ri	sa	ni	dha	pa
3.Greek	F	E	D	C	B	A	G

#### MODERN

Indian.	Sa	ri	ga	ma	pa	dha	ni
	C	D	E	F	G	A	B

According to the *sooktha Pratyekam shadjabhavana*, if we put *ra* over a letter the *mathra* is 2. Pronunciation is *dheerga* and the note at beginning has the status of *shadjam*.

According to *Ranayaneeya* school in North Canara *ri,sa,dha,pa* with stress on *ri* is done.

Role of *stobha* in *saman* chant according to M.L.Sitaraman is that they have carefully preserved musical styles of a remote past , served the purpose of basic melody at a time when the *yazh* and *veena* were not discovered. This statement deserves some consideration since there are references to *yazh* and *veena* even in the vedic and *upanishdic* times. (That we will come to in a subsequent chapter).According to him there had always been two groups among Brahmins .

1.Those who stick to the traditional ancient heritage needed for healthy scientific study of history through preservation.

2.The literary who do not care for that. Ignore the healthy preservation of scientific history and change all texts as they please.

Therefore the Mysore *Purushasooktha* appear monotonous stereotyped while that of Tanjore has a variety of melodic *sthobha*. In Mysore version each of the 4 ricks in the 8<sup>th</sup> *saama* preceded and followed by *sthobha Havu,havu,havu* using B –flat (*kaisikinishada*), C (*shadja*) and D-flat (*ri*) *dha* (flat) and *pa* with frequency 126, 144, 156, 17, 108. Probably that was the essential feature of the earliest music. According to him during the period of *Chanda* (which he thinks mistakenly is in 1000-800BC ) *veena* and *Thamburu* to maintain drone used and it was then called *udggeetha* by *udgatha*. The Indus civilization and the Harappan relics does not support the time he gives. And the fact that before *veena* and *thambura* there were many ancient instruments including *flute*, *yazh* etc to keep drone remains a fact. With or without the instruments the vocalist can depend upon the *sthobha* –the vocal and the text of the veda-which are more important to the *saamagaa* , and the essential part of a *samagana* concert for reproducing melody in perfect union is important .That is why the *sthobha* are still preserved by the traditionalists as a part of history and heritage. The fact is that the *sthobha* existed before Manu is explicit when he says in his *smrithy* that the *sthobha*, the voice of *saamaveda* has become impure during his period.. The reason is that the *vainika* is adjusting frets with subjective measurement and not with scale. (So *Veena* was there during Manu’s period).According to *Gouthama* at least two *saama* should be sung with all the 7 notes. The 2 reasons for the relativity of pitches are

1.connection between pitch and vedic accent

2.natural limitation of voice of individual.like weakness , old age etc.

*Samavedabrahmana* states that the highest pitch is the property of a *deva/gandharva*. Gregorian concept gives the highest reach to a quint or 5<sup>th</sup> or to a sext or 6<sup>th</sup>. *Aithareyabrahmana* 7<sup>th</sup> ch 7<sup>th</sup> *khanda* says there are 7 types of voices. The 3 *savana* of a day correspond to *Thara*, *mandi* is *swaritha*, *sa* is *neecha/athiswara*. *ra*,*madhyasaptha* or 3 *sthaana* /3 voice registers in a *gaathraveena*. The *madhyandina* or noon is *ucha* or highest , doubly higher than the *mandra*. According to T.K.Rajagopalacharyar the 2 *riks* *Abhithwa* and *Nathwavam* of *rathantharasamam* give rise to the 3 *sthothreeyas*. The *sthobha* are primary spiritual language. Adepts of all ages and religions commune with divinity. The morning chant of *agni* is in bass. In noon the voice of *Indra* is middle octave. In afternoon *viswedeva* have the 3<sup>rd</sup> octave. The best middle octave is for steady prosperity and the tremolo vodsanniva has to be sung then. Start with 2,1,2,4,and 5 main notes 1-6 notes are present.2,3,4,6 subordinate ,and end with *sthobha* as(no:1) According to Barend Fadelegon , when we divide *pada* as *parvana* not only words but the letters also should be cared for. The addition of *pushpa* and *sthobha* are equally important. When accentuation system of a language change the musical intervals become smaller and at the same time the faculty of music develop. The change in the form has made it impossible to get what is described in the *pushpasuthra* , in modern times. Dr.V.Raghavan notes that the

music of Hebrews is nearer to the south Indian *kouthuma* style. M.Rajarao says there are 8 types of *swaritha* in *siksha* and *prathisakhya* ,3 types of *nishada*, 2 types of *dhaivatha* , 2 types of *panchama* in *parisheshasiksha* For *mandukyasiksha* , *ni* is *ucha*, *dha* is *prachaya*, *ri* *swaritha*, *sa* *neecha*, and descending scale from *ni* to *sa* is vedic. The vedic people of India knew that each vowel can be split to 2 or more components and each has fixed vibration numbers depending on how it is pronounced . This was not known to any other ancient people (including mediteranean, European, or Chinese, Egyptian) and this is an important factor in determining the ancient astronomical knowledge of the Indians because the mathematical formula used is the same in both. The ancients were aware of the formants of vowels , even attempted to locate them and realize their musical significance.

#### 1.Vajasaneyam:-

*Abinihitham* 2560 vibrations/sec

*Praslishtam* 2460/sec

*Kshaipram*.1840 /sec

#### 2.Thaitheeyam:-

*Kshaipram/nityam* 1084,1840,812

*Abhinihitham* 574/483

*Praslishtam* 362,342

*Saamagana* scale is the current *kharaharapriya mela/kaafi* that.

There are 5 notes in *pavamana* , the *oudhava*. In *Indrapucha* a rare *swara* (7<sup>th</sup> ) is seen.

The 2 *saama* with all the 7 notes are

#### 1.Athraa

#### 2.kasyapavrata dasaanugana

In 10<sup>th</sup> *anugana* or *pucha* of *Aindrasama* there is no *krishtam* or 7<sup>th</sup> in *kouthumasakha*.For *Nambuthiris* there is something called *krishtasaaman* .

Modulations of notes-Maintaining a note is *sampratharana*, prolonging a note on successive over 5 notes producing a vibrating effect is *navanam*.

Common characters between *saamaganam* and music are

#### 1.sthobha in kapaalageetha

#### 2.swara or suvarna or beautiful colours to each note

3, five types intonations or *aagaana* in *jaimineeyupanishad brahmna*

*Mandram, ghohini, vaiswadevi, ucha* or middle of speech, *krouncha* or *madhyama*.

4. *omkaara* , the equivalent of which is *aalapana*, Om is *anantha* or bliss, corrupted to *nom, thom* etc by musicians.

5. The *rishinama* for *sama* is substituted by name of note (*devagandhari, madhyamavathy*), time (*vasantha*) effect (*Deepak, kalia*), name of musician (*mian ke Malhar*)

6. Both create particular effects

7. beginning of *thaala* - *hraswa, dheerga, plutha* in *saama*.

*Drutha* (2 *mathra*) *laghu* (4 *mathra*) *guru*(8) and *plutha*(12)

8.5 Sections for *saama*. *Himkara, Asthayi, antharam, sanchari, abhogam*. similar to music.

9. both has *vikara*/emotions

10. The requisites for *samagayak* and the singers is the same.

11. The purpose is same.

*Kaamasani* (fulfillment of desire)

*Prajanana* (to get children)

*Pasavya* (to get cattle)

*Annada* (to get food)

*Swargya* (to get heavenly bliss)

*Brathruvyaha* (to kill enemy / the 6 enemies like desire, greed etc )

Comparing *Shadvimsabrahmana, Arsheyabrahmana* and *Jaimineeya arsheya Upanishad* Brahmana DR .B.R.Sharma says *Jaimineeya* is very archaic and has obscure vocabulary due to antiquity. There are grammatical peculiarities .Dead and ghosts giving instructions is not seen in any other. There are *thantric* rites in cremation ponds and *gayathrisaman* and *omkara* are more described. It contains metaphysics of life beyond. J.F.Stall gives the 12 ritual chants of *nambuthiri jaimineeya agnishtoma* which are

*Bahishpavamana*

*Ajyashuthy* 4 in number



*Madhyanthinapavaman*

*Rathanthara*

*Vamadevyam*

*Noudaasam*

*Kaleyam*

*Arbhavaavamanam*

*Yagnayagneeya* with 5 *vibhakthy* which explain the *vishtuthy* of the *sthoma*.

One *vibhakthy* is sung in one breath. Walter koufman says that vedic notations of *saman* chant was known only to very few of the initiated and used only for mnemotechnical purposes. *Nagari* (North) and *Grantha* (South) gives manifold variations of notations but the oldest notation is of the southIndian manuscripts. There are 297 notational syllables in the 4 grantha works in India office, London.

1.*samalakshana* or *swaraparibhasha*

2.Two copies of *chalalakshana*

3.*chalaprakriya*

4.*saamaparibhasha* of *krishnaswmi srouthy*

According to *samalakshna*, *kavarga* begin with first tone

*Chavarga* with 2<sup>nd</sup>

*Tavarga* with 3<sup>rd</sup>

*Thavarga* with 4<sup>th</sup>

*Pavarga* with 5<sup>th</sup>

There are 300 *parva* and manifold combinations of these formulae appear.

In *chalaprakriya* a syllable associate with a corresponding finger or hand position. Single or double hand gestures /*karana* etc . Similarity to *poojamudra*, and to the *mudra* of Balinese people who preserve the *mudra* of ancient India is noticed. But no comparison is made between *Mudra* of South Indian dancers with Poojaamudra of *Thanthirc* /*Vedic* rites .These I stress , so that some one may start research on such subjects. The *kusa* grass /hand position has similarity in India, both Hindu/Budhist and in Japan.

5 swara X 3 row =15 *kusa* grass /or wooden stick kept for *samavedin* and Budhist alike. (This is seen in Indus valley civilization seals) Beginning of representing mathematical notations as numerals also is seen. (This shows origin of music and maths and astronomy traced to common root in India)

The literature and study of *jaimineeyasamaveda* in retrospect and prospect by Asko Parpola is very interesting. He says the view of Colebrooke that *Thalavakkara* school of *samaveda* mentioned in *charanavyuha* and *purana* is extent in the past. The name of Jaimini and his epithet as musician (*Thalavakkara*) in the teacher list of *Jaimineeyagrihyasuthra* is not found in ancient texts but in later commentaries according to him. 32 *Swarabheda* are there for 33 notes according to Sabhapathy while for Sahasranam Iyer .K.N. it is 32 only for 32 notes. The hand indications of Kerala are simpler than the Tamil versions. The entire hand swings up and down to mark pitch in Kerala. The fingercode marks only the *visarga* and other textual details.

*Avaroha* is from *Prathama* to *dwitheeya* . *Udgama* ascend from *dwitheeya* to *prathama*. *Yanam* is *sanchara* , going forth in the same tone. *Avartham* is turning from one to another tone several times. (*chathurtha –panchama* for example) . *Kshepana* is tempo descend from *prakrithy* to *vikruthy* . *Marshana* is similar ascend. *Anuamguleemardha* is the thumb gliding over first joints of the pointer and the following finger is paralleled by *swara* example 3 2345

According to Wayne Howard each chant has 5 divisions of *bhakthy* into 7 *parva*. Each *parva* is sung in a single breath. Vertical line show a *parva* is over. Two lines show a *bhakthy* is over. *Lopa* is disappearance and *aagama* is appearance or augmentation .

The *sthobha haavu* is pronounced in *Jaimineeya* as *Haabu*. since *saama* is sung in *somayaga* the *swaroopa* has to be looked for there. There are three singers-*Prasthatha*, *udgatha*, *prathihartha* and a 4<sup>th</sup> is *Subramanian*. The *prasthava*, *udgheetha* and *prathihara* are for each of the first three. *Upadravam* is sung by *udgatha*. *Nidhanam* by all. If there are 7 divisions, *om* sung before *udgheetha* by *udgatha* and *Him* by *prasthatha* before *prasthava* makes up 7. The number of *sthoma* in *paryayam* (turns) and the manner is called *vishthuthy*. The notes indicating the hand positions , that is *gathraveena*. It is interesting to note that among the *kouthumas* of the north *krishta* and *prathama* are on the same hand positions while the southern *kouthumas* and some *samvedis* among northern *kouthumas* keep the thumb 2 *yava* or 1/8 “apart to indicate *krishta* and one *yava* to indicate *prathama*. In Gujrat and UP the chant is uniform at a range of perfect 4<sup>th</sup>.

Discussing the difficult styles of different scholars he discuss the *Nambuthiri Jaimineeya* of Kerala. They have a repertoire count of not more than 24 tonal patterns. Derived from 8 tone gamut with an ambitus of a major 6<sup>th</sup>. Tone one is heard frequently , but its occasional occurrence is clearly purposeful. Tone 3 is only in one motive. Tone 5 result from natural vocal vibrato. Impressions given is of continual ornamentation of central pitch 4. The only pitch held for longer duration. Thrive tone, the upper major second (tone 2) and some lower pitches (6,7,8) alternated in rapid succession to most of the motives. They have no written tradition. Only oral and hence no written notation. Only hand signals. (*kai kaattuka*) which is different from elsewhere. There are obligatory as well as optional *mudras* with hand. Due to these reasons theirs is the tradition which is oldest in the land.

Sa is Rk and Ama is musical notes with which Rk is chanted /sung. Together they form *saama*. (Atharvaveda 14.2.71; Aithareyam 12.12; Brihadaranyaka 1.3.22.) Naradeeyasiksha speaks on the evolution of heptatonic scale (S.V.Iyer)

About the word meaning of *aaroha*, *avaroha* is ascend or descend in music. In *samagaana* when *ga* is sung after *ma*, *ga* is known as *rohapurva*. But from *dwideeyaswara* to 4<sup>th</sup> (*ri* to *ma*) is called *Roha* also besides its common name *karshana*. *Udhoooha* when *sa*, *dha*, *ni* turns *ga*, *sa*, *ri*. That is each note is two notes higher is *udhoooha*. In ascending song the *udhathathama* note amongst the *thritheeya*, *dwitheeya*, *prathama* also called *udhoooha*. There are two types of *saamagaayaka* and they are the *gaayathrin* and the *gaathins*. Those who sing *gayathri* and those who sing *Gaatha*. The *gaathin* sings in praise of a particular deity only. (Viswamithra was the rishi of *gayathri* but was a Gathi too because his father was Gaathi showing when the Gayathri as Chandas was recognized separately in India. Viswamithra being contemporary of Jamadagni, Parasurama and Sri Rama this happened several thousand years before Krishna, Vyasa and Jaimini's time.) In Rgveda swara means sound according to R.S.Walinube.

*Aithareyabrahmana*: *swaram* is divided into *ucha*, *neecham*, *madhyama*. *Upaamsuswara* is lower than the *mandra* and even the person sitting next cannot hear it. According to *saayana*, *mandra* is the most pleasing and delightful. There are 21 *moorchana* and 49 *thaana* and the word *thaana* first appears in *kathyayanasrouthasuthra*. It speaks of three types of *swara*, *samhithaswara*, *brahmanaswara* and *thaanaswara* (from *thanu* or body). *Thanaswara* is *ekasruthy* and is the *sruthy* of *manthra*. It is seen in *Jaiminisuthra*, *Mahabharatha*, and *Purana*. In *purana*, *thaana* and *murchana* are mentioned together.

The word *sruthy* first appears in *sounakarik prathisakhya* and is heard as *udhatha* first. The tone which is first perceptible to the ears is called *sruthy* (perceptible tone) Also as interval between two notes. The *anudhatha*, *udhatha* and *swaritha* when sung one after another gives bliss. To fix the high and low pitches the first instrument used was flute according to *Rishi Naarada* and then came the *Thumburu* or the old *veena* with a gourd resonator. Naarada and Thumburu were two sages who promoted classical music with these instruments. The highest pitch of utterance turned to be the *rishabha* due to its superiority and low pitch the *nishaada*. Middle was *saamanya*. A pitch lower than *nishaada* note is heard due to *anuswaara* as in *sam bha karmanaa* in Rgveda V1 69,1.

A still lower note is *ajyadoha* for samavedins. *Dheevath* (intelligent) are the only people who hear the notes closest to and lower than *Nishada*, and they are *Dhaivatha*. Note down to it is *panchama*. the 5<sup>th</sup>. *Swarapanchama* is thus *ri, ni, sa, dha, pa*. With veena the notes *rishabha*, *samanya*, *nishada*, *dhaivath*, *panchama* were fixed. *Samanya* was *chathusruthy*, *nishada* was *dwisruthy*, *dhaivatha* *thrisruthy*, *panchama* again was *chathusruthy*. *Panchama* and *rishabha* with *sruthy* value 4,2,3,4 is charming. In it *panchama* is used as *samanya*. *samanya* below 4 *sruthy* to *rishabha* is in the border of *thara* and *Madhya* in *sira* and *murdha*. *Panchama* in *Madhya mandra* notes in between, throat and chest. These new notes were called by *saamagayak* as *prathama* (*madhyama*) *dwitheeya* (*gandhara*) *thritheeya* (*rishabha*) and *chathurtha*. These and *samanya* form the octave of *madhyamagrama* in descending order. The *sapthaka* of *gandharva* is ascending. *Prasthava* is the beginning. *Udgheetham* is the high tone ringing. *Prathiharam* is its end. *Upadrava* is coming to the original quickly. *Nidhana* is the *layanam* or completion. *Swaramandala* include both *arohan* and

*avarohan*. *Rish* mean to go or *gathy* and is *rishabhapada*. Narada fixed with his *mahathiveena* the notes of *samagana*.

2        1        3        1 1 1

*Aa jya do haa*.....234 5 m (5 notes 1-5 *swarapanchakam*)

*Prathyekam shadjabhavana* (7 swara)

The saman chant with 7 notes is called *nishaadaadi*. In *samathanthra* there are two *aksharathanthra*, one with meaning and another without. Both are called *sthobha*.

Example of *sthobha* with meaning is *nrime, nitheemahi*

For meaningless is *Haa ee, haa, uoo* etc

Those at beginning of words is *anuayin* and after the word is *anusanghin*.

*Krishtadisapthaka* is *ma, ga, ri, sa, ni, dha, pa*.

9 types *parathuthkrama*

4 types *athikrama*

5 types *karshana*

3 types *swara*

2 types *premkha* (which begin in *prathama*, and which begin in *dwitheeya*)

34 types *bhaava* (*saama suthram* 777)

2 types *gathi* (*aigathy* and *ughathy*)

*Paribhashapadam* is translation of *swara* into *akshara* (*sahitya*)

A *manthra* from *Ranaayaneeyam* is

*Haaa eeeaaa haaaa aaa haaaa aaa*

*Di dee hiviswathaspru yu:*

(There is a underline for *haa* which means it has to be pronounced as *dheergha*. After *hiviswatha* there is no syllable so it is the *Prathamawara*.

This is pure and simple *aalapana*.

*Paribhashapatha* means translating *swara* into syllables or *Akshara*. Which was a very ancient practice in Indian music and mathematics.

Uhagana or *Uhyagana* is the threefold nature of *gana*.

*Channagana* has *sthobha* only. *Leshagana* has a *sthobham* and *rk*. *Ahargana* has *Rk* only and this term is used in *Jyothisha* for the number of days counted.

If the *nidhaana* is the *akshara* of the *Rk* it is *Antharnidhaana*, and if not it is *Bahirnidhaana*. There are 18 *bhaavaas* described. *Saamagaanakriyapadhathy* of Phani Mahadevasasthri (Mahadevasasthri granthaprakasan samithy Surat 1984) *Gaathraveenaamudra* are given. This was how the 5 swaraas were first described by the Guru to the disciple.

1."1-"

*Aayi* (Put a line above to show it is pronounced as *dheergha*) Thumb is put on little finger Bring it to index finger. Thus the *gaathraveenamudra* and the *lipi* and the pronunciation corresponds each other.

2.1^

*Ayeee*. The index finger place is the *ghanaswara* here. (*dheerga*) Index finger is down towards the thumb.

3."I"-Tip of thumb from root of index finger to its tip and again moved to middle part of

it. The note is sung with a swing in faster tempo than that used for a chant.

4.*Hiya* (23 for *hi* and *ya*, 1,1,1,1,) written as 2 3 4 5

1- Index finger tip, then to tip of middle finger, middle part of first part of little finger. (When we do this the *swara* that is shown by the finger *mudra* has to be sung with each note having each *mathra* duration.)

5. Over a letter if we put *Ra* the syllable has to be uttered quickly.

6. 7=pa higher than or nearer to Ma. *Mandraswaram* in *Naradeeyasiksha*.

The 5 That's are produced by *Swarantharam* from *sudha Bilawal* (*Sankarabharana*) where pa is *krishta* and ni is *athiswara* but they are never the starting *swara*.

*Ma ga ri sad ha* (*Bilawal*)

*Ga ri sa dha ma* (*Yaman*)

*Risadhamaga* (*Bhairavi*)

*Sadhamagari* (*Kafi*)

*Dhamagarisa* (*Asaveri*)

### Reading Sapthasaindhava script as musical language.

Before the languages /*saahitya* or alphabets that we now use evolved the *sapthasaindhava* people had their communication through changes in their tonal patterns, by their *mudras* , and by placing grass in a particular order, and also by making knots on naturally occurring tendrils (called *vallimudichal* by the *aadivaasi* of kerala).

In the early Harappan period (BC 3600-2600) on clay pottery we can see about 150 *mudra* or symbols many of them are numbers depicted as signs. The most common one is the halfmoon put by the nails of the potterymaker, just as the *ardhachandramudra* made by a lover on the body of his /her mate. To write ten , 10 nailmarks (*ardhachandra*) were put one below the other on the pot. The concept of numbersign, and of communicating ideas as pictographs and *dasaamsa* were thus present as early as 3600 BC or even before. The other common signs associated are the arrow, the triangle, the U with 2 branches on either side, and the two circles intersecting each other. This is the earliest picture of *Pavithra* or the two interspersed *Naaga* and it is a figure which was used by Euclid several centuries after in his scientific astronomy.

The figure which is seen in *Thovary* cave and in the Ahmes papyrus is for finding the octagon as I had discussed earlier. (Ref *Bhashaposhini MalayalaManorama* Publications )The Indian tradition is to have individual *lipika* for each of the following .

- 1.The *Jyothishi*/astronomer who records every stellar/planetary events in the sky and the corresponding changes on earth with year, month, *paksha*, *dina*, *hora* or hour
- 2.The *Ithihaaasa/Puraana* writers who records the chronology of kings , aristocrats and the chieftains and their *prasasthi* , their deeds and words and their achievements
- 3.Those who survey land and fix area of the earth, nation, fields , gardens etc.They are the *Rajjukaaraas* and work in association with the above two categories of *lipikaas*
- 4.The *Dharma/Nyaya* schools of thoughts who decides the law of the country
- 5.Those who write the *karma*/rituals and their order in relation to the seasons, months, days etc
- 6.Those who write *prasasthy* of each temple/regional *kshethra* with the importance of the *vighraha* , its ways of worship, *pooja* etc
- 7.The research oriented learner who study for the sake of study of *sasthra* and arts alone.
- 8.Those who incorporate all these and teach the common man through the *lyal*, *isai*, *nataka* (music,drama,dance,literature) and gets patronization from kings

The writings were individual collections /orally transmitted and kept as most valuable in each family by the elders and taught only to those who came with real fervour for learning. The writings being in palm leaf /cloth/barks/etc were perishable and each disciple *parampara* had to copy it for their use and for later learning/teaching. Therefore the number slowly increased with local changes due to regional differences and hence the *kulasangha*(Guilds of families ) decided to have a common language which can be understood by all groups in their way and interpreted as *chitralipi*. If this common language has developed in BC 7500-8000, which is the Mehrgarh period , as the seal or sindhulipi as we know it today, the beginnings must be even anterior to that. This *lipi* as the archeologists study as the communicative language to the outside world as that of merchant class is thus belonging to a wide group of cultural backgrounds. We can interpret the Indus script in each of these ways. To understand that a wide communicative and administrative network existed between India and the outside world and at the same time to think that Indians did not know each other or have a centralized system is to say that we are closing our eyes to shut out bright sunlight and say that it is dark night around.

When a sonorous body resonates and human beings experience it all musical theories and practices originates. The contributions to musical theories are made by mathematicians and physicists and not by musicians in the western world . This is true of the east as well. The function of a musical instrument , including a human body that vocalize music , is extremely complex and needs a sophisticated and sound theory to explain it and the philosophers, mathematicians and sages who were wellversed in *sabdasasthra* had contributed immensely to this branch. To know the function of a organpipe or a flute (which were very ancient instruments of human race) one has to know the principles of turbulence theory.

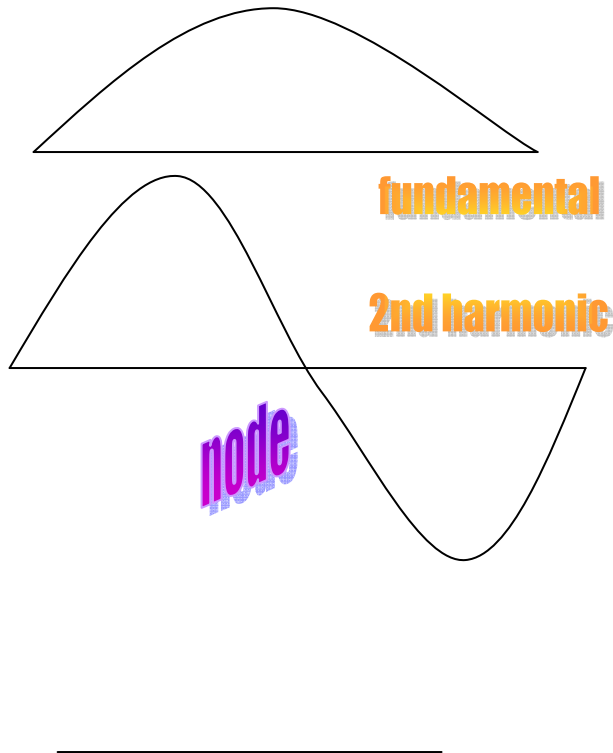
There is a vibrator (the source of vibration) and a resonator for music. A string does not produce sound if left by itself. It needs a resonator to transform mechanical energy to acoustic energy. If musician is a vibrator, the Rasika or listener/enjoyer is a resonator. 10000-15000 years ago in an old cave in France a man holding the upper part of bow in mouth, and lower part in left hand and playing with right hand is shown. The resonator is a sheet or spruce of wood called a sounding board connected to a piece of wood , called the bridge . In wind instruments vibrator is a reed (clarinet, saxophone, oboe etc) or a musicians lip (horn, trumpet, trombone) and jaw (mukharasankhu ) a flow of air (flute, organ) .Resonator is column of air around the source of sound and it depends upon the material with which it is made .

Free vibration:-After a brief action of percussion or plucking , the body is not subjected to external constraint or *aahatha* , yet continue to vibrate on its own. Percussion instruments, harpsichord, piano,guitar etc

Driven vibrations:- sound is sustained by the musician blowing into mouthpiece for wind instruments , or by a bow in case of string instruments . A vocal singer , and violin , flute etc.

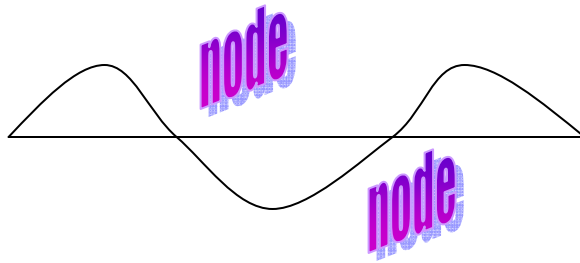
String or *Thanthreevaadya* :- A *thanthri* or *rajju* of length  $L$  and mass per unit length  $\mu$  bound at both ends is subjected to tension  $T^1$ . There are 3 types of possible vibrations : transverse, longitudinal and torsional.

The 3 natural modes C,C,G of a transverse vibration in sound from a string are the fundamental , the second harmonic and the third harmonic with nodes (which are called *Raahukethu* in India).

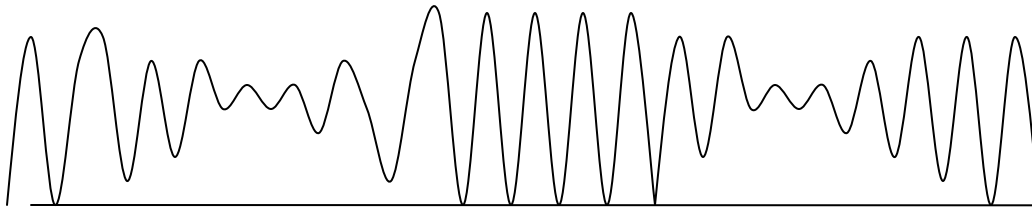




**3rd harmonic**



Two strings out of unison ,yielding 2 fundamentals  $s_1(t)$  and  $s_2(t)$  with close frequencies  $f_1 < f_2$ . (see below) and their superimpositions as a sum of the signals producing a beat .



The sum  $s_1 + s_2$ . When the 2 sines are in phase they strengthen each other ( $t=0, t=0.5, t=1$ ) and when out of phase, at times  $t=0.25$  and  $t=0.75$  they cancel each other out. This leads to the beat. The sound is amplified and attenuated periodically with frequency  $f_2 - f_1$  (Here 2 Hzs). The resulting sound has intermediate frequency  $(f_1 + f_2)/2$ .

The two strings can be adjusted to same frequency simply by eliminating this beat. Note that the musician is not measuring the frequency of an individual string, but the frequency and speed of a beat produced by 2 or more strings. This is because, a difference of half a hertz for 2 strings played consecutively is completely undetectable by even the sharpest sense of hearing. But a beat half a Hertz for strings played simultaneously is perfectly detectable by anybody with a little bit of practice.

Tuning the octave:

F3 at 174.6 (if), F4 should be  $2 \times 174.6 = 349.2$

If we think that it is too high, say at 351.2 Hz, it will produce a beat  $351.2 - 349.2$  Hz with a fundamental of F4. Then tuning is done, by progressively lowering the frequency of F4 until the beat disappears.

The fifth:- Fundamental of C4 is  $3 \times 174.6/2$  Hz. Its second harmonics has frequency  $3 \times 174.6$  Hz and so does the third harmonic of F3. The fifth can therefore be tuned by listening to the beat between these 2 harmonics until it has almost disappeared.

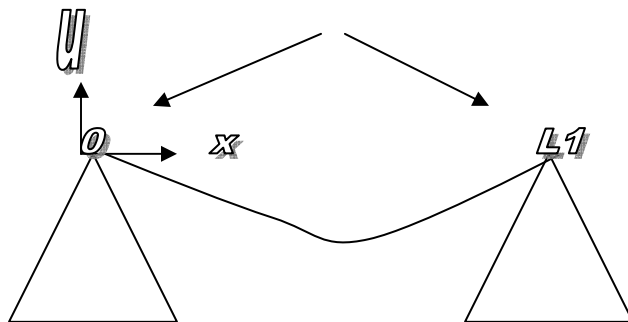
Major third:- The speed is adjusted for tuning the major third.  $F_3$  produce fifth harmonic with frequency  $4 \times 220 \text{ Hz} = 880$ . Hence these 2 harmonics are combined and lead to beat of 7 Hz detectable with a little effort. The speed of this beat depend on pitch of third. It will be twice as fast one octave higher. If we reduce major third (with  $F_3$  frequency  $880 \text{ Hz} / 5 = 176 \text{ Hz}$  in this case) we get a third with no beat .

Consonance was defined in the west by Helmholtz in 19<sup>th</sup> century as a description of the extent to which the harmonics of 2 notes played simultaneously coincide , or instead produce a beat ,then the octave is the most consonant interval ,followed directly by the fifth and hence the importance of the latter in a scale design. The consonance existed a s samvadi in Indian music thousands of years back as shown by both Sanskrit and Tamil texts .

Bar or a rod of rectangular shape with either a circular or rectangular section is the vibration source of several instruments.

Xylophone is a instrument with wood. Vibraphone with metal .With addition of tubes as resonators and a rotating valve device to modify amplitude periodically ,the celesta (rods struck by a hammer) certain types of pianos , music boxes , reed in wind instruments etc.

A bar fixed at both ends is there in a xylophone. The position is constant , the slope vary with time and curvature is equal to zero



just as  
for strings the natural modes are standing waves and share the same form. But the natural frequencies

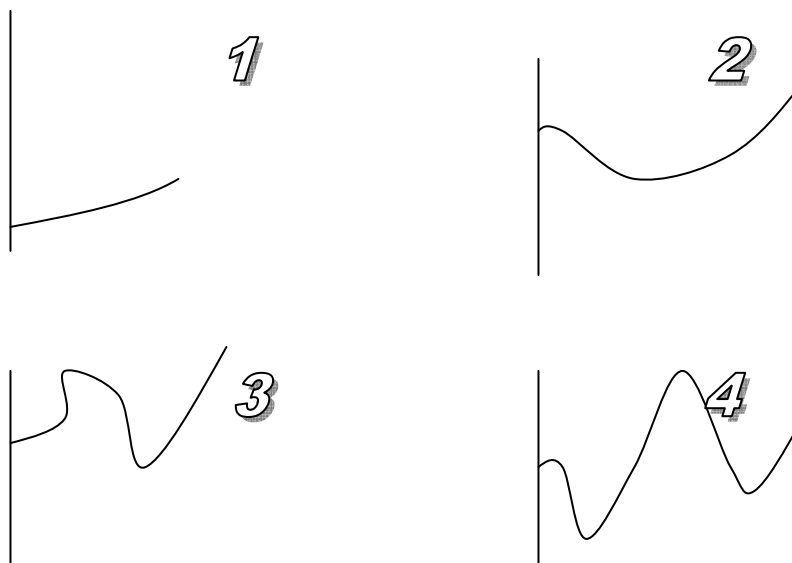
$f_n$  now follow a quadratic progression 1,4,9,16,  $n^2$  as opposed to arithmetic progression of the string's natural frequencies.

Regarding length:- Natural frequencies have become inversely proportional to square of length .

Another difference: Mode can be seen as superposition of 2 travelling waves propagating at speed of  $2\pi f_n / K_n = \sqrt{2\pi g c_L f_n}$  now dependent on frequency now called dispersion (Vikirana) .The traveling wave in space will spread out (*vikirana*/disperse) since high frequency components travel faster than low frequency ones.

Because the frequencies are all integer multiples of the first frequency, the resultant sound is periodic with period  $1/f_1$  and lacks certain harmonics (octave ,fifth above it) thus contributing to the xylophones peculiar sonority.

Bar clamped at one end :- Vibrates freely at other. Where it is attached  $x=0$ . At  $L$  (where it is unattached) it admits 2<sup>nd</sup> and 3<sup>rd</sup> derivatives equal to 0. The first 4 modes (which are natural modes and standing waves) are :  $n=1$ ;  $n=2$ ;  $n=3$ ;  $n=4$  as shown



below.

Unlike in a fixed bar the natural frequencies are no longer integer multiples of the first frequency  $f_1$  or for any other frequency  $f$ . Therefore the frequencies  $f_n$  are not harmonics and are partials . Numerically the values  $f_n$  are proportional to sequence 1,6.27, 17.55, 34.39..... Here the speed is greater (faster) at beginning than for a fixed bar.

A quadratic equation progression similar to fixed bar progression is possible if the  $n$ (number) is high enough .The resulting sound is then considered the melodious .The resonator in the ear also help to eliminate high partials in case of music boxes etc.

The material is removed to reduce thickness at attached end and to reduce frequency at the other end in case of bars.

Membranes: Usually have a circular membrane frame. Radius  $R$  arranged horizontally with a specific height.  $T$  or tension is uniform throughout membrane. Mass per unit volume is  $\mu$  and it is the solution to a wave equation just as in strings.  $C = \sqrt{T/\mu}$ .

Helmholts equation works here too. The membrane edge is circular and to analyse polar co-ordinates is easy.

In Bessels equation, when bounded in zero, the Bessel function of the first kind of order  $m$  (denoted as  $j_m$ ) :  $j_m(z_{mn}) = 0$ .

The first approximate values of this  $z_{mn}$ :-

m/n	0	1	2	3	4	5
0		2.40	5.52	8.65	11.79	14.93
1	0	3.83	7.02	10.17	13.32	16.47
2	0	5.14	8.42	11.62	14.80	17.96
3	0	6.38	9.76	13.02	16.22	19.41
4	0	7.59	11.06	14.37	17.62	20.83
5	0	8.77	12.34	15.70	18.98	22.22

These natural frequencies are partial and general solutions to wave equations are obtained by superimposing natural modes.

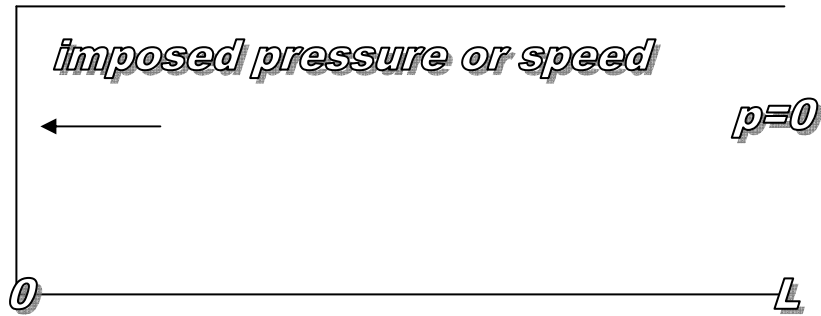
The waves are not standing waves but rotating waves usually clockwise.

The contour lines of the first 8 natural modes are :

The values were computed from eigenvalues of finite element matrix and are close to the values given. Note that the last value is 22.22 (the sruthi with which the Melakarta repeating cycles are permuted and combined).

Wind instruments : Resonator is column of air. The sound is sustained by musician in a flute.

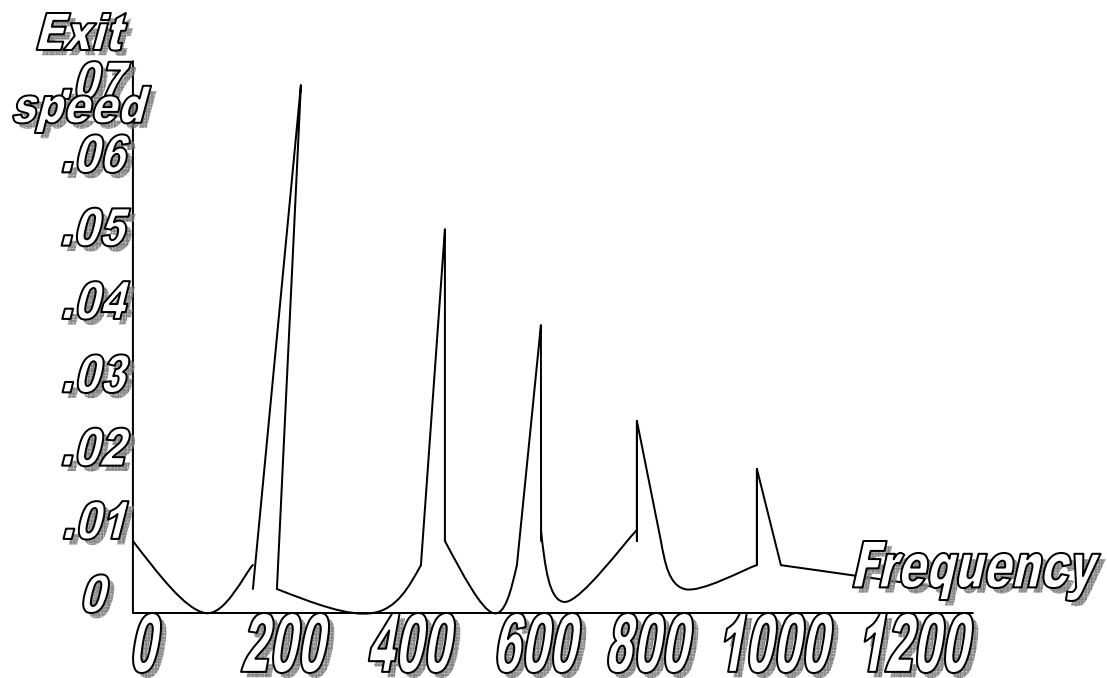
A cylindrical tube with length  $L$  through which a plane wave travels along OX axis. Acoustic pressure  $p_a$  depends on  $x$  and  $t$  only and is



$p(x,t)$ .

Pressure control is done in flute, flue pipes, organs. Speed control is done in reed instruments, like clarinet, reed pipe or an organ. For the Indian flute it is a dual control.

The absolute exit speed for a tube with length 77 cm according to frequency, taking damping into account, the tube resonating at frequencies where peaks occur :-



Speed control and pressure control :- In open and closed pipes.

Pressure nodes and natinodes for first 3 possible modes according to control and nature of exit –open or closed. The number indicate order of harmonics. Pipes that are twice as short produce the same fundamental but show no even harmonics. (see below for figure)

*Naaga* worship (Phoenician /*Phaneesa* tribes) of India and in IVC .See the image below how to get a fishsign from the speedcontrol figure 3 of the open pipe .

*open pipe*

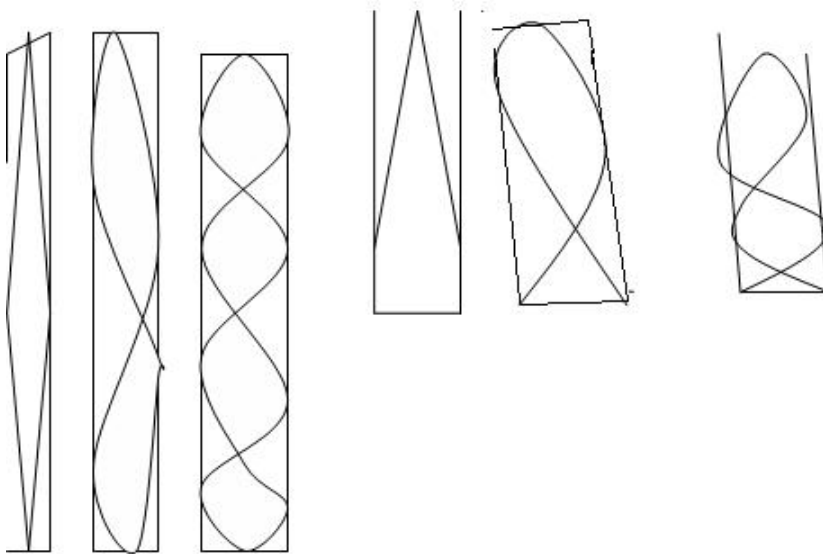
*closed pipe*

*1 2 3*

*1 3 5*

*pressure control pressure control*

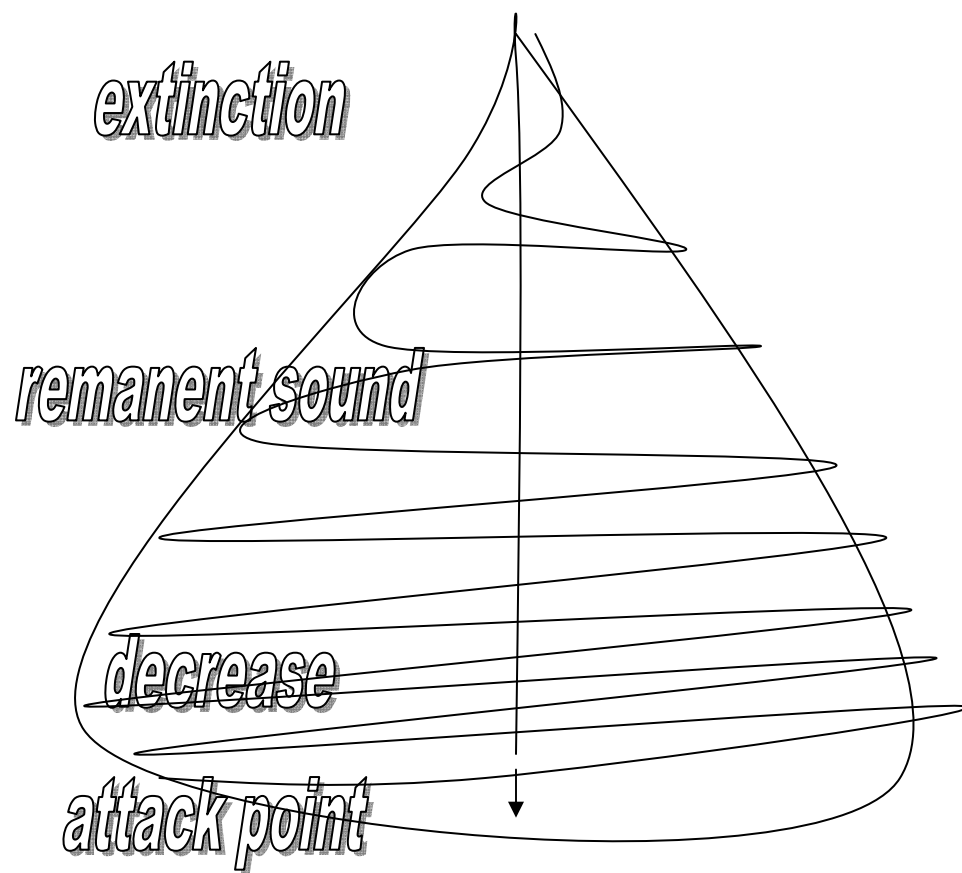
**open pipe**  
**speed control**  
**1 3 5**



□

Sinusoidal signal  $\sin 60 \pi t$  amplitude modulated by the envelope  $e(t)$  is as below:





A scale :-

1	2	3	4	5	6	7	8	9	10	11	12	13
C	C	G	C	E	G	Bb-	C	D+	E-	F-	G	G#+

C D E- F# G G# + Bb- C	NOTES IN OCTAVE
1 9/8 5/4 11/8 3/2 13/8 7/4 2	FREQUENCY RATIO AS FRACTIONS

C D E F	Pythagorean scale
G A B C	6 <sup>th</sup> century BC
1 9/8 81/64 4/3	Octave ratio 2 and the fifth ratio 3/2 the simplest. The fifth is the diatonic scale named after Pythagorus.
3/2 27/16 243/128 2	

This scale is considered elegant. It uses 2 types of intervals between consecutive notes : The tone with a ratio 9/8 and semitone with ratio 256/243. Aside from 5<sup>th</sup> the Pythagorean ratio does not coincide with harmonics.

$81/64=1.266$  is higher than the corresponding harmonics which is  $5/4 = 1.25$  and the difference which is difficult to notice in melody become noticeable in harmony (when a Melam is used). This is because of the beat effect .

Zarlino scale :- Aristotle's pupil Aristoxenus , a musician in 4<sup>th</sup> century Greece said one should trust ones ears and not the mathematics while hearing music. His chord produces no beats and sounds pure. In 16<sup>th</sup> century Zarlino picked up the idea of this pure music and introduced a chord .

C	D	E	F	G	A	B	C
1	9/8	5/4	4/3	3/2	5/3	15/8	2

Notes :-There are 3 types of intervals between the notes in this. Semitone with ratio  $16/15$  has 2 types of tones.major tones C-D,F-G and A-B with ratio  $9/8$  and minor tone B-C and G-A with ratio  $10/9$ . The discrepancy between these two types corresponds to frequency ratio equal to  $(9/8)/(10/9)=81/80=1.0125$  , an interval called syntonic comma approximately equal to a ninth of a tone.

Bach composed music in 18<sup>th</sup> century. Chromatic scale was known to Chinese by 2600 BC (Lin Louen a minister ). They used it to transpose 5 typical pentatonic scales of Oriental music. Between the first and the last note it had a frequency ratio  $(3/2)^{12}=129.75$ .

If the last E $\sharp$  would correspond to the enharmonic F (closest F) it would be nice to limit the number of notes on a keyboard . It was found that the enharmonic F of the E $\sharp$  corresponds to the ratio  $2^7=128$ .Then in 18<sup>th</sup> century Bach and the like started to think , that  $129.75 \approx (3/2)^{12} \cdot 2^7 = 128$  makes it impossible .The number on left is odd and on right is even.The gap between the two notes which corresponds to ratio  $(3/2)^{12} \cdot 2^7 \approx 1.014$  is called a Pythagorean comma.

A compromise was needed.Werckermeister in 1695 set the equation 12 fifths=7 octaves and favouring consonance of octaves he decided to spread the excess comma among the 12 fifths of the cycle by slightly shortening them.The tempered scales were thus born in western music.In equal temperament for all the fifths are equal and correspond to the ratio  $2^{7/12} \approx 1.498$ . But equal temperaments were known to prince Chu Tsai –Yu of Ming dynasty (1368-1643) and adopted in 1596 at least one century before Europe.Tuning fork in Europe was invented only in 1711 by Luthier John Shore while it was known to Egyptians millennia before. The tuning flutes existed before that. A 4 of the tuning fork has changed over centuries from one place to another. The tuning fork of a city depended on its economy. If fund is short the pipe is cut short , and tuning fork went up. The 1704 tuning fork in Paris opera was 405.3 Hz (todays Ab) and it went up to 449 in 1858. It was 434 in London and 455 in Brussels. Vienna congress set it as 435 in 1885. 1953 international conference London cut it to 440 Hz. Now it is between 440 and 444 depending on the orchestra. Think of the value in ancient India and Egypt and in tribes of Neolithic people who used bone flutes.

Giving names to notes: The oldest nation to give notes names is India .Later Latin countries named them and in 11 th ecentury Guy d'Arrezzo sought to define a codification for intervals.

The Anglosaxon and German notations are different slightly.

Look at the telltale evidence of these principles developed by various countries of the world from the photo album on musical instruments and also the *melakartha* scale and its development by Indian *samaveda* chanting system through *Bharatha*, *Mathanga* to *Venkatamakhi*, *Vidyaranya* and upto date in India . None of the mathematical acoustical, astronomical principles of soundwave were unknown to them and this is shown from their architectural and cultural remnants and practices which is continuous for a prolonged period and is still a living system of tradition.

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Chapter 27 A grand unified theory for a multicultural,integrated curriculum using music for world peace.

The music therapy and a curriculum of *advaita* for world peace , which I advocate, is based on the following :- I do admire Albert Einstein , not for his contributions to science alone. But for the way he outgrew all the marginalisations he faced during his lifetime so that he emerged as the Person of the century in 2000 selected by Times magazine, as against Roosevelt and even our own Mohandas Karamchand Gandhi. Why this special admiration for him ?

The example of Einstein who was born in a marginalized community of the time , but came up in life with all those marginalisations should be our model. Some people , even after being famous and well acclaimed , goes on increasing the gaps in society by repeated complaints about their early experiences in the society, from the loved ones, and the male-dominated power games and so on. . Even if these trials and tribulations do exist, I would prefer to overcome them by my cheerful countenance at all odds and by my achievements , rather than complaining forever against injustices as they have been doing .(real as well as imaginary!!)

This admiration of mine , is also applicable to personalities like Yesudas, who came up in life and profession, as a colossus , against all odds in life. It is not just a person's fame, wealth or professional contributions, but also the life and the ideals in life which the next generations see and emulate and admire. Therefore, intellectual women like me admire men like Gandhi , Einstein rather than the alltime complainers . For me, the male/female divide is only a construct and intellectually in *advaitic* framework all *Athman/Brahman* .Souls are One .This practical *advaita* or grand unification is applied in all my projects and ideas and in curricular plannings.

What is the aim of life and education?

Happiness is the aim of all human activities ,including learning. Happiness is dependent on contingencies like health, wealth, reputation, friendships, love etc. But , for all these to have in a balanced way, humans need an intellect to think, and reason and do accordingly in a systematic way. This contemplative thought about the greatest bliss and the means to achieve it , is thus the aim of life and education and whether our educational curriculum is giving this faculty of developing happiness becomes important for an educationist. This is the intellectualist position of all curriculums . In Indian education this was important as the *Upanishads* say all *meemamsa* (research or enquiries) are due to the *Aananda* (bliss/happiness) that one derives from it. Aristotle also believed that theoretical or contemplative thought and capacity for it is happiness. There the east and west philosophy meet. Happiness is not the subjective wellbeing (SWB) of contemporary psychology and it is not a temporary phase of happiness that one seeks. When one does not have wealth , he/she feels wealth is needed for happiness. When health is lost , then people say that health is the most needed for happiness. The fact is that all these contingencies can be achieved by a judicious systematic life and thoughtful logical way of conducting in the world and this is the valuebased education system which gives continuous

happiness , including food sufficiency , agroecology bringing in its turn a socioeconomical system where people have a healthy life. The here and hereafter are thus harmoniously blended in a valuebased education where science and spirituality have no difference.. This is a platform where both atheists and God-believers can meet since atheists like Bertrand Russel and H.G.Wells were awed by the mysteries of universe just as any traditional spiritualist .The order of universe is something that harmonises all living things into a bond of comradeship , and it does not include only labourers or any one community , let alone humans alone. The birds, animals,and the smallest life form has a place on this orderly universe and its oneness with the inanimate world is science as well as spirituality. Thus entire *chara* and *achara* worlds (moving and nonmoving ) are one in the thinking mind of a person who has come to the classroom of my valuebased education system. There we have to find a meaning of all meanings. Happiness is not just absence of pain as Stuart Mill wrote, just as health is not merely absence of disease.

Hume said celibacy, fasting, penance, self-denial, humility , silence and solitude are virtues of monks and they serve no purpose for ordinary human beings and these does not make a person a valuable member of society. But we have found a living example in Gandhi contradicting Hume's statement. Gandhi demonstrated all such monkish virtues quoted by Hume and had proved himself to be the most valuable individual the world had produced in the last millennium . How his values had been valued by entire world and how it had been useful to all who came near him itself bear testimony to this. It had served a purpose to millions of people in more than one continents , as all of us know.

Hume includes humour, recreation, enjoyments of fun in his definition of happiness. But to have them, one needs to be permanently happy as Gandhi was. Gandhi had a rare sense of humour which no one else had. And about recreation and enjoyment of fun that is relative to different individuals depending upon their tastes and temperaments. Different games and pastimes are for that . And the individual as well as regional differences are there in them. (Which one can learn just by being in a special region and culture without any difficulty as we will see below regarding *kolam* etc by south Indian girls). Robert Lane noticed that in western societies income, education, health and intelligence have increased after the second world war , but they have not made them more happier than their ancestors. So happiness is something related to the internal thoughts of bliss and its understanding , rather than external factors which we can acquire.Positive thoughts are needed for it ..The need for money is never satisfied by individual or by policy makers of Government as we see from their request for more and more funds. So how can one achieve happiness with money ? When will new luxuries and technologies and commercialism which require more and more markets cease to satisfy all human beings to be happy with them ? And about health , after all the years of costly research tools and discoveries what had medical science done to increase happiness of humanity? The cost of treatment does not give the result which they are expected to give and people are left penniless with a hospital stay and new disorders are detected as sideeffects of new research processes and medicines. And even doctors are unhappy and unhealthy. How can such a community give health and happiness to all ? The health propagandas are making people fearful and maniacs only. Satisfaction from health needs also is unlikely in such a background. How much the educationists, social workers and Governments are able to cope with such situations when they themselves are in a dilemma not knowing what to do except taking aids from

center, world bank or from any other source they get hold of. (knowing very well that it will only save their faces for the short period of their political power and it is not a permanent solution for the nation or world). As a doctor I started to think about these from 1972 onwards. I was concerned about the problems my region as well as my profession and my nation face in these fields. The lack of nutrition, use of chemicals causing diseases in children and adults naturally leads one to food production, agro-economy and its status in our nation. The waterborne diseases and impure water supply and problems concerned with water conservation and judicious use is also related subject. The poverty and lack of education and the cost of living and of medicines were directly felt by me and my husband while we were working in Calicut Medical college. And we worked out a system of helping as many people as possible by spending one person's salary for it. If Humes definition is correct we would be considered as people who sacrificed enjoyments of fun, recreations that cost money and also luxuries (so that we can help another soul) and we are not useful citizens of society. But if we take Gandhi's definition we are the most useful citizens to this nation and world. That we can leave for posterity to debate and decide. We will return to our integrated multicultural curriculum and value-based education with music therapy as its inseparable part.

When we are thinking about a multicultural integrated curriculum for entire humanity we have to define some aspects of it and how they are controlled by the political powers. This we can call the politics of education, because ultimately it is the political power which determines what is to be taught or not taught. In his article on "Beyond Eurocentrism" Prof Ram Mahalingam of Uty of Michigan (ch 10 pp189-198. Multicultural curriculum Mahalingam McCarthy Routledge 2000) has observed that Indian Mathematics had always been a product of the elite, hierarchical society and Brahmins and *Kshatriyas* were mathematicians of India while labourers and women were not given Mathematics education. Unfortunately this is not a truthful observation. He quotes from *Manusmrithy* (translated by Doniger 1991) but that translation alone cannot prove anything. Especially since he himself has quoted two examples (One of *Kolam* and other of *Pallamkuzhi*, both sports of women of South India) which requires lot of mathematical skill and geometrical awareness and abstract thinking. In North India the play called *Leela (Gyan-Choupad)* and the *Dhooli chouki* and other types of *Chowki* also are of this type. And the study of Music which involves abstract mathematics also is well documented from ancient times. The labourer class were responsible for counting and reporting and making complex calculations of the grain produce, cattle, classification of weight and measures and also of taxation etc and these were taught right from *Kudipallikooda* level to all children by a local teacher. The children learned all these as games (due to their age this is the best educative method) and that is how *kolam* and *pallanghuzhi* and *Leela, Chowki*, stories (*purana, Ithihasa*) were taught in primary level schools of India. This was available to all alike. The secondary education they had from a local Guru according to their talents and practical needs. That is what we now call a professional education so that the person will have a job and a livelihood (Vocational). This usually starts at home with his/her own father/uncle/mother etc and then if the child is enthusiastic the best Guru is selected by parents themselves so that they get trained. The abstract subjects like mathematics, science etc were always

chosen by only a few . It never had been a mass popular subject. It is taught only to those who are really receptive and to pursue a graduate/postgraduate level training in that particular subject. It is this specialized study that was lacking among women and labourers. This is not because of any hindrance to study but because majority does not like subjects like that. Even today it is like that.

The articles I wrote on Indus valley culture , the weights and measures used by them etc prove how the labourers and women have to know mathematics of utilitarian type and how the abstract concepts had been devised by the elders with more specialized knowledge in the subject. Manu's laws can be equated to the rules and regulations of the civil and criminal courts and not to religion or spirituality of India. But unfortunately Manu is quoted by many as the spiritual/religious authority of India. The laws and regulations of any nation have a precedence of experience of disturbance of law and order by certain procedures and a defensive to prevent such occurrences further . The law is made for human beings to ensure peaceful living and not for disrupting it. So, the laws are applicable only to conditions/cases where there is a disputed situation.

What Mahalingam says about *Kolam* and *Pallanghuzhi* is my concern here. *Kolam* artists learn it from their mothers, sisters (traditional family transfer of knowledge) and to become competent *kolam* artist one has to have geometrical knowledge, strategic understanding of how to transfer knowledge to actual practice, make decisions on the spot depending upon available space so that she can reduce or increase size in proportion. Thus a complex abstract thinking and its practical application is taught as a traditional transfer of knowledge as an art, and a game for each girlchild. So how can we say that such knowledge was denied?

Then about *Pallankuzhi*:-Played by 2 people. Each has 7 cups and each cup has 6 beads .(42). Each has to distribute beads, one in each cup in clockwise direction. Then pick up next cup and start again until she reach an empty pocket. The player can take beads next to empty cup. The game continue till all cups emptied. With whatever beads won , they restart game. This game involves distribution and regrouping of numbers and an excellent memory for recognizing various positions of game as in chess. The distribution and regrouping is what is called a *prasthaara* , and this is done in both music and astronomy in advanced mathematics. This is taught as a game means it is an educational excellence of the teacher who devised it , is my view. But Ramalingam considers it is a gender marginalization for women . Probably being a male (as well as a *Brahmin* himself from the name) he is misunderstanding /misrepresenting the ability of a girlchild to pick up such abilities earlier and faster than a male and he fails to see that even a lowborn labourer can play and understand such higher functions of mathematics through a simple game .The educational psychologists were really good in their selection of teachers from each household (as traditional/parent to offspring) so that the brain development starts at home as a primary school.

Such subaltern or region-specific teaching methods occur in all regions, all languages and all communities and when sage Mathanga speaks of *Desi* Tradition he means this (Brihadhesi of Mathanga .Dr .V.S.Sharma 2009 KeralasangheethaNataka Academi).When such *dsi* practices are codified and made



universalized by proper theories and proper order then it is called Margi and this is what is done by curriculum committees /universities etc which have finally to be agreed and implemented by the Government (whether modern or ancient).Therefore , when a regulation comes it is after several millennia of development of a cultural tradition transferred by local people /men and women. Unless we know this the separatisms will go on and gaps between classes will remain and a classless global society will remain a dream. Hence the philosophy of *advaita* came up in India for all to be loved and valued equally. That is the spiritual tradition of India .

Social epistemology being an enquiry to improve knowledge production and distribution, the way of distribution to all alike , even to children as games etc has to be appreciated and valued in Indian mathematical consciousness. As Mahalingam suggests the native subaltern mathematician also is an active participant in multiculturalist discourses and our cultural legacy and knowledge systems are equally important and we know it perfectly well , and instead of complaining perpetually about some imagined marginalization, by some imaginary elite class , we (Women of India, like me ) are taking up our issues boldly and with a knowledge that if we were marginalized it was not because of any one else, but by our own lack of interest to pursue such subjects as mathematics .Only by this step the marginalized societies (whether women or labour class) can make the classless society a reality . By self-marginalisation and complaint forever the separatism and gap will remain forever. Thus the concept of Eurocentrism is not an issue for a globally thinking mathematician of India who has studied both systems and compared it. This is my personal experience and opinion. I don't feel a marginalized woman , but I acknowledge the fact that many women do not like the subjects which I address to because of their own choice and not by the restrictions of society or by Government. To pursue sciences seriously one needs a concentrated one-pointed devotion to that .That is the reason for self marginalization in many groups now and this must have happened in ancient societies as well.

When we devise a multicultural integrated curriculum , it is meant for all , but who is interested in it and who pursue it is not in our control is what I mean as a modern educationist. If we are efficient, we should therefore introduce games, musical experiences etc into curriculum which will give the desired effect to all .**The theoretical aspects will remain always the fields of the elite. But its practical effects will reach all.**

Ethnomathematicians recognize at least 2 areas of mathematical literacy.

1.School mathematics

2.Mathematics of a given cultural group

As small children have mathematical knowledge of their cultural group from parents and *Kolam*, *Pallanghuzhi* etc are reflections of those. When this is replaced by the modern school mathematics , the ancient traditional mathematical knowledge is left as a game and not pursued further as a system of mathematics. This is a natural outcome of replacing ethnomathematics by a new Eurocentric one as Mahalingam calls in his article. The traditional mathematical knowledge is not included in the curriculum of modern Indian schools/universities. Therefore , it is now that the marginalization of *Kolam*, *Pallankuzhi* etc as ethnical curiosities , has happened if we think logically. Not by the

*Brahmin/Kshathriya* times .The *kolams* patterns in Indus valley civilization sites show how important this had been even in those remote times . The modern technologies and modern weights and measures etc when compared to Indus valley system gives us evidence of how human consciousness and knowledge has evolved beautifully over several millennia in a region , and how that had stimulated technology and advancement of sciences in another rregion (when Europe came in contact with India). Thus we realize how an indigenous knowledge has given rise to Eurocentric knowledge. One is a continuation of another and there is no gap between them. But to know this one has to come in contact with both. and study both. The cultural gaps are only differences in knowledge and communication, related to languages and to specialized interests of each human being and society from one another. The professional specialization is another factor in separating us. But , with a little bit of compassion and love for all we will be able to overcome such gaps . This is the basics of my integrated, interdisciplinary , multicultural curriculum which is a practical way of a grand unification of all sciences, arts, cultures etc for world peace.

The curriculum is guided by health, fundamental processes, a worthy homelife, a vocation for livelihood, a enlightened citizenship , and worthy use of leisure time , and a humanitarian value of compassion to all creation. These increase our selfesteem and are important for satisfaction and happiness.The nonending desire is the cause of sorrow while a fruitful life like this is the doorway for happiness. It educates one to be useful to society, home, nation and world at the same time remaining happy and facing life with courage and with a compassionate heart, enjoying every moment of it . It should come from a co-operative effort of all citizens of world and from all of us alike and every single person is valued for being a contributor to this cause and it is not money alone which is contribution, but ideas, thoughts, suggestions, service to community and also commitment and model one gives to posterity which is valued by all alike.

Education is for happiness and peace of individuals and of society and of entire world.

We have seen people who are never satisfied with anything in life , even if they have everything- Money, power, good education, good family , good husband/wife and children . Yet they go one complaining about everything . There is another group who are really deprived of such things and need them . The complaints they raise are for their rightful share on this earth. Only if an educator/administrator can differentiate between these two we can achieve a balanced economy and a balanced wellshared system of rights and duties. This must be the first aim of any educative system and administration. How to strike a balance is the real question that one should address oneself. All our strategies should be based on this. All human beings need basic amenities and for that each one should have enough food , health and energy for work and job opportunities. The food reserve depend upon food productionand in a world with increasing population food production cannot be neglected. The decision to make a tropical country with enough geographical features for natural vegetation, biodiversity , and food for all into a concrete jungle is detrimental to entire world. The deserts should be

made into construction sites .The fertile lands and forests left as such so that the water tables, the food reserves and the natural resources for all life forms as well as tourism benefits will increase . If we stick on to this policy , and then give our priorities as food, health, education, and job in a comprehensive way , we can achieve protection of our ecotraditions and culture and yet be global citizens sharing our products for those are not having them. Thus we can make education and sociopolitical awareness into powerful tools for happiness and peace.

### Changing perspectives on education in India

There are several definitions on education. This (which Chiropractic people have given) is only one among them. We will consider here three terms they used in the definition.

1 Growth. Education is a powerful tool in growth and progress of a person and through him/her the society/nation/world is important. Growth is not the physical growth alone, but mental, intellectual, spiritual –a total personality development for human resource development of entire humanity. The total healthy development of such an individual gives a dynamics to entire world. All facets of life of person and society are enriched by the overall development and growth-that is intra and interpersonal successful relationships, bonds, alone with success in professional, sociopolitical, economical, artistic, scientific fields of entire humanity happen through the contribution of a well educated developed mature human being. Such a person is an ornament to society and to world.(I can quote Mohandas Karamchand Gandhi as a jewel of India in this context).The question is does our present day curriculum provide such a development to people? Does it allow total personality growth or just remain something for getting a job, and making money by the easiest methods? And does all the educated people come out as committed citizens of society and of humanity? If not, the aim of education is not yet fulfilled and one has to find out alternatives for achievement of this goal of education.

Growth is definitely a goal of education. But it should not be uncontrolled growth of one cell (person) or a clone of cells over others (pathological) but a physiological natural growth of all cells according to needs of the entire body (physiological) and this simile from medical language distinguishes normal and abnormal growths .The growth of one person should assist in growth of entire society, nation, world and only then the growth is natural and valuable and perfect . Education envisages such growth.

2.The term formal. Formal means as an adjective correct, serious, and conforming to accepted conventions. Or an official , publicly currently recognized method. (which need not be correct or may be correct-either ways can happen). As an adverb formally means a legally approved, or official , prescribed procedure through regular formal channels like schools, colleges, universities etc. This is decided by a Governmental agency in power .

But human education is not only formal but informal training and growth is a process, due to informal education (or partially due to it) is an accepted fact by all educators, teachers, parents, and students (by all people alike). Therefore that term is slowly being replaced by educationists for a better definition. Most of them now include both formal and informal learning in education.

3 The term empirical. Developed as philosophy of Roger Bacon mingled with St Augustinian tradition, by about 13<sup>th</sup> century in Oxford. But in 13<sup>th</sup> century the Oxford teachers came for education to Bologna and Paris, the important centers of Christendom, and return to Oxford and taught the spirit and idea of Paris papal court. And even those who never went to Paris, and who learned in Oxford were under the influence of this Parisian influence. This intellectual supremacy and authority of a single orthodox tradition over international intellectualism is personified in Empiricism.

Indian educationists (Changing perspectives in Education Ed Denis Coelho. Indian Social institute of New Delhi 1995) noticed that every one is trying to define education on subjective objectives/aims and spelt out that the true education has some aims which allow both individuals as well as nations to which they belong, and through them the entire world has to become strong and mature and self-reliant.

The value-based education has to be a human-oriented, universally acceptable one for progress of human race as a whole and on an eco-friendly basis. For this an integrated curriculum-oriented formal as well as informal awareness is needed. This is the Grand unification of entire cosmos, sciences, arts, humanity and other life forms, nature in its ecological multidiversity. This is the value based education for entire human race.

In the introduction to the above mentioned book it is rightly said that Education goes beyond, academic excellence, cognitive growth and aims at human growth which calls for involvement of the whole person, mind, heart, and will in learning process. HRD aptly sums up higher aims of education. It should initiate a social change for betterment of humanity and nations. Brazilian Paulo Freire said learning is to critically analyse and deepen self-perception leading to conscience building. Mode of learning is a dialogue, in which love, humility, hope, and faith prevail. This is called the process of liberation by Freire. We are in this world, to transform, rather than to adapt ourselves to it. For Gandhi also the education was not just a system maintenance but system change. Whole life and practice is needed for that type of value-based, value-building education. Education is that which allows a person to manage entire life, survive problems and crisis, and in that experience and problem solving and survival, be productive and helpful to entire nation and humanity and nature. There are no limitations for such an education and ability to respond to whole of life and nature in a positive way. It is an integral life partnership with environment in which we are placed as dynamic organisms. The eco-friendly education alone can save the world. Thus total literacy is not just reading and writing ability, but it includes the ability and growth to decide sociopolitically what we need and how we can achieve it. To prepare for such an education, the formal, empiricist, authoritative and moneymaking-oriented, job and degree oriented education

alone is not enough .This understanding has lead to the discourses of alternative methods like integrated curriculums, value-based education etc.

I had been a teacher for medical students (undergraduates/postgraduates) and have seen the problems of education that lead to social evils . And how to diminish them and give a positive impetus to my profession (Medical science) and the Medical teaching curriculum , and thus improve the human life had lead to the value-based education I am advocating.

This does not negate the formal studies. But supplement it with informal value-based integrated learning so that each human being is useful to him/herself, to family, society, nation and world .This is a goal which I have devised from my own experiences in life, personal and professional and as a social and philosophical thinker .This is not a theoretical discussion . But a practical method which if implementd would lead to a visible positive change in society. But , as said earlier,only if one has political powers and decision-making powers one can implement such plans in a formal curriculum .

Dr Malcolm S.Adishesiah has given the following headings to his chapter on Philosophy of education :-

- 1.Education is holistic
- 2.Education is learning
- 3.Education is work
- 4.Education is a dialogue
- 5.Education is service
- 6.Education is character building.

And in fact education is all these and beyond.

Thomas V.Kunnunkal is concerned with education as nation building.He mentions four goals –all interlinked as a composite goal.

- 1.Education for Integral personal development
- 2.For national development
- 3.For community
- 4.For culture and values. Kothari commission (National commission on Education 1964-66) had introduced social dimension to objective of education.The title of its report itself is Education and national development. 1986 National education policy envisages education that promote national cohesion, scientific temper, independence of mind and spirit, goals of socialism, secularism and

democracy –fundamental to allround development , material and spiritual. National selfreliance can only be attained by such growth.

The question again is have we reached that ? If not, why? Have we become a highly productive, selfsufficient nation, humane, caring for others, a modern nation, a united India ? If not , is our formal classroom education satisfactory? Have our formal education failed to infuse the enlightened citizenship ideals and values in our people ? If so is it not necessary to change the definitions and the methods? And what alternative suggestions , we as educated and experienced citizens of this land and of this earth (as members of human race) can contribute for that ? It is this constant reflection and experiences and experiments that had given rise to these ideas of mine.

For transformation of mindsets , our Governments started decentralization programmes as part of NEP . But , each decentralized part is showing separatist tendencies and showing that they are not yet mature enough to be responsible citizens of a democratic nation . Only if this state level decentralization is successfully undertaken, the second and third levels (district/local Panchayath levels) can be successful. But a simultaneous decentralization from local Panjayath levels will be better undertaken with the state decentralization so that the low and high levels can meet at middle levels. This major area of action also has been slowly being implemented.

What should be included in a value based curriculum? Can any one say that what he/she thinks as value is acceptable to all? No. But there are universal values . Justice, equality, freedom, fraternity , unity beyond all differences of caste/creed/sex/sociopolitical class etc, truth and nonviolence, honesty .This modern, Indian, Humane values are also the most ancient , global and ecological values . This if any institution/person accepts and puts to practice one can accept. Otherwise not.

Human resource development involves Relationship of a person to oneself and to society. Whether I am an asset or liability to myself and to society depends upon the development of my skills , abilities, my ideas, my virtues, values and my practical life. Without such values a nation cannot build up its valuable HR . Therefore , it is not mere reading and writing ability but ability to analyse and cognize the present situations, ability to change them for betterment of entire humanity which distinguishes a person from others. For this knowledge of past is needed. History is for that purpose. If education (formal) has failed in this respect, we have to seriously think of its causes and make a change for the betterment of our society. Without values , if we produce moneymaking luxury loving machines with academic titles of doctors and engineers and IT professionals , does our nation improve? If we produce them with all the academic excellence +values would not that be ideal for us ?

In the integral pedagogical paradigm Louis Xavier regards PROCESS of education as a cultural TRANSMISSION from generation to generation. It is accumulated wisdom transmitted through ages by humanity. ( The same definition is given by Charaka to *Prathisamskaara* ).The academic excellance is replaced by human excellance in valuebased approach (which also includes academic excellance). Academic excellance do not include human excellance, but human excellance includes academic excellance as well.

The interiorized choices become externally manifested in our actions . Our actions show our convictions . Practical use of our values are manifested only when we act in a certain manner.Effective feedback make us explore further , and find out alternative methods/solutions for the accepted /formal current ones . Every teacher/learner/educationist have experience of all these steps in their process of education.The evaluation and further growth , by reexamination of whatever had happened , and reflection on it leading to improved actions has an effective cyclical pattern .The only problem in implementing this is when educational institutions adopt fragmented approaches , narrow specializations, sidestep the central concern for the human person/personality development as a whole .When values are neglected and a child/person is subjected to education just for the sake of formal training to be a specialized professional (with no commitment to values/nation/world) this happen.We have witnessed this already .

A spiritual version of world over materialism

Concern for others over selfish egoisms

Simplicity in face of consumerism

Cause of justice in face of social injustice

These are the ideals /values which teachers and students of modern world need to inculcate in a valuebased education for positive change in society and world .

For this we need

- 1.A unifying vision . (A grand unification theory or *Mahaa advaitha* as I call it)
- 2.Enrichment of dynamics of pedagogy by insight gained from contemporary educational psychology (which one gains from practical experience as well as from books on the subjects and compare both)
- 3.Development of a wide range of course materials for implementing this pedagogy. These are to be viewed as models to facilitate a teaching-learning process.
- 4.Staff development programmes involving in-service traing .Training the trainers programmes .
- 5.Exchange of expertise and experience among people who practice this . This open exchange will develop and let the discipline grow .

Thus education (life long including informal and formal) leads to generation of a new society which believes in high values. This has not occurred with the current method of education we are following as Dr William Madtha points out in his article. He writes:-Lust for money , awards and sex at the cost of values has become the fashion of the day , even among academicians. The corruption and misuse of finances by administration is also pointed out by him as a result of this .He points out how the *Nishkaamakarma* (selfless service) can make individuals mature and capable of assuming their responsibilities. Only such a qualitative education which inculcate this can restructure society .He mentions that core curriculum has to be designed so that it connects with life, viz, to promote national

values such as Indian common cultural heritage , egalitarianism, democracy, secularism , equality of sexes, ecological sensitivity, freedom , observance of family norms and scientific attitudes to life, that is spirit of enquiry, creativity, objectivity, courage to question, methodology and an aesthetic sensibility. National unity (Oneness ) should be felt by all by such education. In restructuring institutions, in giving autonomy to institutions accompanied by their accountability and in selecting educators etc one has to exercise extreme care.

Educators with personal qualities, educational qualifications, and professional competence are needed .(pp 49 Education for generating a new society). They will be assets to the institutions they work as well as to the nations they serve. Instead of that electing people who have educational qualifications but no values will do harm to institutions as well as nations. State incentives for accountability of teachers and educators will increase their performance . Sociopolitical awareness is needed in a democracy to succeed. Without allowing free expression of such ideals at local levels , and without giving awareness of its importance at all levels no educational system is complete . That is why adult education and continuing education are important.

Jesudasan (a Gandhian studies expert) gives the importance of Gandhi as an educator . He observes that his analytical thinking was as radical as that of Marx but more constructive than Marx in search of solution for the whole problem. Both are social philosophers and activist reformers , concerned with reconstruction of an ideal society. But methods were very dissimilar when it comes to gross alienation and violent reaction of labourer to exploitations (Marx) and subtle exploitation and method of nonviolent non-co-operation of the exploited. (Gandhi) As part of the social educational pedagogy to remedy the evil Gandhi tried to introduce at formal educational structural level , productive and life-sustaining work experience as center of the whole learning process. Work is basic and central to education, not as an employment or money-generating activity , but as sustaining life in the whole superstructure of society. This is more scientific than any other theories of education. But India did not experiment with this vision of our own educationist Gandhi , but adopted the system of the white-collar job oriented system . Even with that we can start implementing the ideals of Gandhi-Simple living, high thinking, and equality of all and *nishkaamakarma* as service to all.

The importance of ecological education is not to be neglected. Nature is common property resource of us. Shared by all alike. Therefore it is heritage of all , not only of humans but also of all living creatures. Therefore , Think globally and act locally to conserve nature should be taught right from childhood to all human beings. And this cannot be done without awareness of our biodiversity, our traditional ways of conserving it and all these are learned from generations of oral tradition. Not from a formal classroom alone . Though each teacher can facilitate this way of learning by inculcating a desire to know more about our environment and how to protect it etc. Practice of a ecofriendly life right from beginning is inculcated in children by parents themselves and school teachers can augment it . Thus formal and informal education makes one grow and mature and become an asset to oneself, to one's family, society, nation and world . Though we have not visited all continents, by thinking as a world citizen and acting at



our own little sphere of activity (local environment) we can contribute and be a valuable citizen of world. This is the value-based education needed for every human being .

It integrates all the love, compassion, scientific temper and artistic talents , cognition and imagination in one person for the sake of the entire living and nonliving world of existence.

This may seem a Utopian dream. But is not. It is a practical dream, for each one of us to internalize, enjoy , practice in our life and be happy thereby making others also happy. And Governments run by such individuals would make heaven on earth .

Novalis : All illnesses are musical.

Auden : All healing is musical.

Suvarna Nalapat : All illnesses of the world can be prevented, cured or healed musically.

Musically bidding Au Revoir !!!!

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